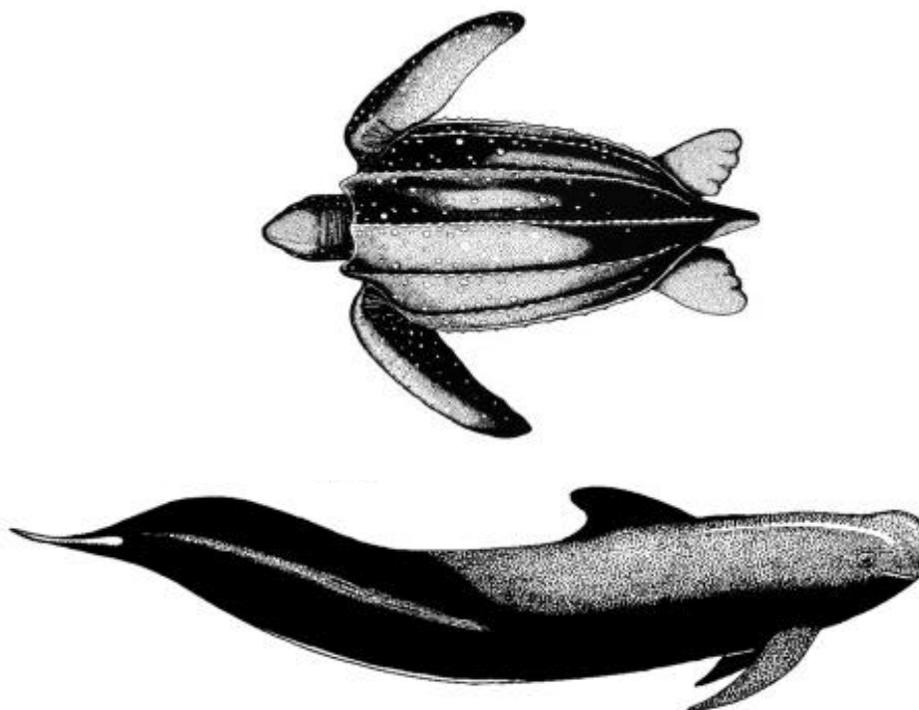




NOAA TECHNICAL MEMORANDUM NMFS-SEFSC-527

**Estimated Bycatch of Marine Mammals and Turtles in the U.S. Atlantic Pelagic
Longline Fleet During 2003**

**Lance P. Garrison
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Abstract

The U.S. Atlantic pelagic longline fleet operates throughout the Gulf of Mexico, along the entire U.S. Atlantic coast over the continental shelf and slope, and in distant water areas including the central North Atlantic and the Canadian Grand Banks. The Atlantic longline fleet is defined as a Category I fishery under the Marine Mammal Protection Act, and it is also the subject of management concerns under the Endangered Species Act due to interactions with marine turtles including leatherback and loggerhead turtles. Using data from the pelagic longline fishery observer program and a mandatory fishery logbook reporting program, total bycatch of marine mammals and turtles in the longline fishery was estimated for the year 2003. A delta-lognormal approach was applied to estimate region specific and total annual interactions and mortality for the fishery. Total interactions observed during an experimental fishery in waters off of the Canadian Grand Banks are also documented. Any effort fished under a excepted fishing permit (EFP) and not reported in logbooks is not included herein. The primary marine mammal species interacting with this fishery were Risso's dolphin (*Grampus griseus*) and pilot whales (*Globicephala sp.*). Marine turtles that interacted with this fishery were primarily leatherback turtles (*Dermochelys coriacea*) and loggerhead turtles (*Caretta caretta*). Potential sources of bias and uncertainty in these bycatch estimates are discussed.

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Introduction

Pelagic longline fisheries target large pelagic fish predators including swordfish, tunas, and sharks throughout the world's oceans. In 2003, the U.S. Atlantic pelagic longline fleet operated throughout the Gulf of Mexico, along the entire U.S. Atlantic coast over the continental shelf and slope, and in distant water areas including the central North Atlantic and the Canadian Grand Banks (Figure 1). Because longline fisheries use relatively non-selective fishing gear, the U.S. east coast fishery has long been the focus of bycatch reduction efforts for non-target fish species (e.g., billfish Goodyear, 1999), marine turtles (Witzell, 1999), and marine mammals (Johnson *et al.*, 1999). The Atlantic longline fleet is defined as a Category I fishery under the Marine Mammal Protection Act (50 CFR Part 229, Federal Register Vol. 69, No. 135, 15 July 2003) due to frequently documented interactions with marine mammals. The fishery is also the subject of management concerns under the Endangered Species Act due to frequent interactions with marine turtles including leatherback (*Dermochelys coriacea*) and loggerhead turtles (*Caretta caretta*).

The pelagic longline fishery has had an extensive fishery observer program (Pelagic Observer Program, POP) in place since 1992 to document finfish bycatch, characterize fishery behavior, and quantify the interactions with protected species (Lee and Brown, 1998; Beerkircher *et al.*, 2004; <http://www.sefsc.noaa.gov/pop.jsp>). A mandatory fishery logbook system (FLS) has also been in place since 1992 requiring boat captains to report fishing effort, gear characteristics, and commercial catch (Cramer and Adams, 2001; Bertolino *et al.*, 2003). These data on absolute effort and observed bycatch

rates have been used to generate annual estimates of marine mammal and turtle bycatch (Johnson *et al.*, 1999; Yeung, 1999a; Yeung, 1999b; Yeung, 2001; Garrison, 2003).

Management actions have resulted in significant changes in the behavior of the fishery since 2000. A partial closure of The Northeast Distant (NED) water component of the fishery that operated in international waters off the Canadian Grand Banks and near the Azores Islands was in effect for the period October 10, 2000 to April 9, 2000 (65 FR 60899-60892, October 13, 2000). The entire NED was closed to fishing effort on June 1, 2001 (Figure 1 Label E, 50 CFR Part 635, NMFS 2003). An experimental program was conducted where gear was set from September 4 – November 3, 2001; July 15 – November 2, 2002; and June 29 – November 2, 2003 in which the effects of gear characteristics, environmental factors, and fishing practices on marine turtle bycatch rates were evaluated. During this experimental fishery, observers were aboard all pelagic longline fishing vessels operating in the NED area, and all fishery sets were conducted in accordance with an experimental design.

Several additional time-area closures have been introduced into the fishery due to concerns over finfish (NMFS 2003, 50 CFR Part 635). These include year-round closures near the Desoto Canyon in the Gulf of Mexico after November 1, 2000 (Figure 1, Label A), and in waters off the Atlantic coast of Florida after March 1, 2001 (Figure 1, Label B). Seasonal closures are in effect in the Charleston Bump region between February 1 and April 30 (Figure 1, Label C), and a bluefin tuna area off of the New Jersey coast between June 1- to June 30 (Figure 1, Label D). These closures have resulted in both a redistribution and decline in the total effort in the fishery.

In this report, marine mammal and marine turtle bycatch estimates are calculated for pelagic longline fishery effort and for the NED experimental fishery during 2003. Any effort fished under a excepted fishing permit (EFP) and not reported in the logbooks is not included herein.

Methodology

Geographic Stratification and Pooling

Fishery observer effort is allocated among 11 large geographic areas and calendar quarters based upon the historical fishing range of the fleet (Figure 1). The target annual coverage for 2003 was 8% of the previous year's total reported sets, and observer effort is allocated randomly based upon reported fishing effort (Beerkircher *et al.*, 2004). The bycatch estimates developed for each species here are therefore stratified by geographic area and quarter to reflect the design of the observer program.

In the current analysis we used the approach of Garrison (2003) to account for gaps in observer coverage. Bycatch rates for quarter-area strata with >10 reported longline fishery sets that had no corresponding observer coverage were replaced with the mean bycatch rate observed in the quarter-area stratum across the previous 5 years. For some cells, there has been no historical observer coverage within the previous 5 years. In these cases, no bycatch estimate was made, and these strata are identified as potential sources of negative bias in the regional and annual estimates for 2003.

Delta Estimator

Sets in which a portion of the longline broke away and therefore had multiple recorded haul times were combined into single sets, consistent with the approach of Yeung (2001). The mean and variance of catch rates for marine mammals and turtles in observed longline sets was calculated using a delta estimator (Pennington, 1993). The unit of effort in this analysis is the number of hooks, consistent with methods used to estimate total catch and bycatch of finfish and previous analyses of protected resource interactions (Johnson *et al.*, 1999; Garrison, 2003). The delta mean bycatch rate for each analytical stratum, t , is calculated as:

$$(1) C_t = \frac{m_t}{n_t} e^{L_t} G(s_{L_t}^2/2)$$

where:

m_t is the number of sets with observed bycatch,

n_t is the total number of observed sets,

L_t is the mean of the log-transformed number of animals taken per 1000 hooks when bycatch occurred.

$s_{L_t}^2$ is the observed sample variance of the log transformed bycatch rate, and

G is the cumulative probability function from the Poisson distribution given as:

$$(2) G(s_{L_t}^2/2) = 1 + \frac{m_t - 1}{m_t} (s_{L_t}^2/2) + \sum_{j=2}^{\infty} \frac{(m_t - 1)^{2j-1}}{m_t^j (m_t + 1)(m_t + 3) \dots (m_t + 2j - 3)} \times \frac{(s_{L_t}^2/2)^j}{j!}.$$

The series was computed numerically over j terms until meeting a convergence criterion of a change in the function value of < 0.0001 with additional terms (j). Convergence was generally achieved with < 10 terms. The variance of the delta estimator is:

$$(3) \text{ var}(C_t) = \frac{m_t}{n_t} (e^{2L_t}) \left[\frac{m_t}{n_t} G^2(s_L^2/2) - \left(\frac{m_t - 1}{n_t - 1} \right) G\left(\frac{m - 2}{m - 1} s_L^2 \right) \right].$$

When m is equal to 1, the mean bycatch rate reduces to the simple mean rate where

$$(4) C_t = \frac{\exp(L_t)}{n_t}$$

and

$$(5) \text{ var}(C_t) = \left(\frac{\exp(L_t)}{n_t} \right)^2.$$

The C_t calculated above gives the mean number of animals killed per 1000 hooks in the observed trips. To estimate total interactions, N , these rates are multiplied by the total number of hooks reported to the FLS database for each analytical stratum. The stratified estimates and associated variances were summed to provide annual estimates for each species. Approximate 95% confidence intervals were calculated assuming lognormal distribution of total mortality as N/C and $N \cdot C$ for the lower and upper confidence bounds respectively where:

$$(6) C = \exp [z_a \sqrt{\text{var}(\ln N)}]$$

and

$$(7) \text{ var}(\ln N) = \ln [1 + \text{var}(N)/N^2],$$

where z_a is 1.906, the z score for $\alpha = 0.05$.

Marine Mammal Serious Injury Determination

The Marine Mammal Protection Act (MMPA) requires that mortality and serious injury of marine mammals incidental to commercial fishing operations be reduced below

potential biological removal (PBR). “Serious injury” has been defined as an injury likely to result in mortality (NOAA Fisheries 50 CFR 229.2, Angliss and DeMaster, 1998). A workshop of NOAA Fisheries and external experts was convened in 1997 to evaluate the types of injuries occurring in commercial fisheries and guidelines for determining if a given marine mammal observed interacting with commercial fishing gear was seriously injured. For small cetaceans, including pilot whales and other delphinids, it was concluded that animals that ingested hooks, were released with significant amounts of trailing fishing gear, were swimming abnormally, or suffered some obvious severe external trauma should be considered seriously injured (Angliss and Demaster, 1998). Serious injury determinations are to be made on a case by case basis after reviewing the observations and comments of fishery observers. For this study, observer comments for all takes of marine mammals from 2003 (Table B3) were reviewed and serious injury determinations were verified based upon observer comments and photographs consistent with current NOAA fisheries guidelines.

Sea Turtle Life History Form

During 2003, detailed information on the characteristics of longline interactions with sea turtles has been recorded by the fisheries observers (Table B4). Information included on the form includes detailed descriptions of the type of interaction, the extent of entanglement, the location of any hook attached to the animal or swallowed, and other data (Appendix A; see <http://www.sefsc.noaa.gov/seaturtlefisheriesobservers.jsp> for more information). Information on entanglement, hooked animals, and the location of hooks are summarized in this report.

Results and Discussion

Reported Fishing Effort and Observer Coverage

The total reported pelagic longline fishing effort included 7.0081 million hooks during 2003 (Table 1b). The reported fishery effort included 9,505 sets during 2003, and of these 1,088 were observed by the POP program for an overall coverage of 11.45% (Table 1a, Table 2a, Figure 2). However, observer coverage was only 6.15% excluding the NED experimental fishery. Observer coverage for specific area-quarter strata typically ranged between 3-8% of reported sets (Table 3). However, there was incomplete coverage of the SAR, SAB, and CAR and no coverage of the TUN and TUS geographic areas (Table 3, Figure 2). The coverage during the NED experimental fishery was essentially 100% of the reported effort (Table 3) consistent with the design of the experimental fishery. The area-quarter strata with >10 reported sets in each and no associated observer coverage are identified in Table 3a. Observer coverage was available for some of these within the previous five years, although there has been very little historical observer coverage of the TUN and TUS areas.

Observed Protected Species Interactions

A total of 28 interactions with marine mammals were observed during 2003 (Table 4a, Figure 3). The majority of these interactions were observed in the MAB region, followed by the experimental NED fishery and the NEC region. There were 304 observed interactions with marine turtles, with the majority of these (172) occurring during the experimental NED fishery (Table 4b, Figure 4). The greatest number of turtle takes during non-experimental fishing effort occurred in the GOM region (Table 4b).

The majority of interactions with marine mammals were with Risso's dolphin (*Grampus griseus*) and pilot whales (*Globicephala spp.*). Additional interactions were observed with striped dolphin (*Stenella coeruleoalba*), common dolphin (*Delphinus delphis*), Atlantic bottlenose dolphin (*Tursiops truncatus*), Atlantic spotted dolphin (*Stenella frontalis*), Beaked whale (*Mesoplodon spp.*), Minke whale (*Balaenoptera acutorostrata*), an un-identified dolphin, and an un-identified baleen whale (Table 5, Figure 3). One marine mammal (a Risso's dolphin) was observed to have died and 8 were seriously injured in 2003. The most common serious injury type involved being released with a significant amount of entangling gear (Table 5, see appendix B3 for details).

One leatherback turtle was observed dead during 2003 (Table 6a). The vast majority of the remaining turtles that interacted with gear in 2003 were characterized as being released alive and injured, based upon recorded information on the sea turtle life history form (Table 6a), and the majority of these were hooked (Table 6b). Leatherback turtles were most typically hooked in a front flipper, while loggerhead turtles more often swallowed the hook or were hooked in the mouth (Table 6b). In the NED experimental fishery, the majority of fishing gear (hooks and line) was removed prior to release, with the exception of turtles that swallowed hooks. For those cases, the trailing line was generally removed from the turtle before release.

Total Estimated Bycatch and Mortality

Observed marine mammal and turtle interactions for individual longline sets are listed in Appendix B. The quarter-area strata estimates for marine mammal mortality, serious injury, and live releases are presented in Table 7a-d. The only marine mammal

mortality occurred in the NED experimental fishery in the third quarter (Table 7a). The majority of estimated marine mammal serious injury occurred in the mid-Atlantic bight region (Table 7b, Figure 3). The marine mammal species with observed interactions during nonexperimental fishery effort were Risso's dolphin, Pilot whales, common dolphin, bottlenose dolphin, beaked whales, and Minke whales (Table 7c).

Stratum estimates of mortality and total interactions for marine turtles during 2003 are shown in Table 8. The highest incidental takes of leatherback turtles during all quarters occurred in the Gulf of Mexico (142, 209, 120, and 368 estimated interactions in quarters 1-4 respectively, Table 8c, Figure 4). For loggerhead turtles, the highest estimated take in 2003 occurred during the 2nd quarter in the NEC area (167 takes, Table 8c, Figure 4).

The average bycatch rates and estimated catches in strata that were not observed during 2003 across the previous 5 years are summarized in Table 9. In several cases, additional takes of sea turtles and a marine mammal were estimated to have occurred in unobserved strata.

The marine mammal with the most interactions with longline fishing effort in 2003 was Risso's dolphin with 105 (57 – 193 95% CI) estimated interactions (Table 10a). Marine mammals that were estimated to have most often suffered serious injury or mortality in the longline fishery during 2003 were Risso's dolphin (40, CV 0.633), Atlantic spotted dolphin (30, CV 1.00), and Pilot whales (21, CV 0.775) (Table 10a). There were an additional 7 documented interactions with marine mammals during the NED experiment in 2003, which included 1 mortality of a Risso's dolphin (Table 10b).

There were estimated to be a total of 1112 (842 – 1469 95% CI) interactions with leatherback turtles during 2003 (Table 11a) in the non-experimental fisheries. The majority of interactions with leatherback turtles occurred in the Gulf of Mexico (838 [607 – 1159 95% CI], Table 11a).

For loggerhead turtles, there were an estimated total of 727 (511 – 1035 95% CI) interactions during 2003 in the non-experimental fisheries. The majority of these interactions occurred in the NEC, FEC, and GOM (Table 11b). During the NED experimental fishery in 2003, there were 79 interactions with leatherback turtles, 92 interactions with loggerheads and one interaction with an olive ridley turtle (Table 11a-c).

Sources of Bias and Uncertainty

The fishery logbook data is a mandatory reporting program, and thus it is expected that reporting rates are generally high. Due to the intense management focus on the longline fishery, there has been close monitoring of reporting rates, and observed trips can be directly linked to reported effort. In general, the gear characteristics and amount of observed effort is consistent with the reported effort. However, underreporting of effort is possible in this fishery and would result in a direct negative bias in bycatch estimates.

Observer coverage in the pelagic longline fishery is generally high in comparison to that of other commercial fisheries, but lower than the target 8% (Beerkircher *et al.*, 2004) when the NED experimental fishery is excluded. The sampling level may be sufficient to provide reasonable quantification of interactions with protected species. However, in some strata where there was effort greater than 10 sets there was little or no

coverage during particular times of year. The most notable gaps in coverage in 2003 occurred in CAR quarters 2 and 4, SAB quarter 4, TUN quarter 1, and TUS quarter 2 where there were relatively large amounts of reported fishing effort. The estimated bycatch based upon the previous 5 years of observer coverage contributed additional numbers of takes for two of these (CAR quarter 4 and SAB quarter 4). Applying observer data from previous years is inherently uncertain since bycatch rates can vary strongly in time and space. Estimates for those strata supplemented by previous observer coverage should therefore be treated with caution since even the direction of bias in these estimates is unknown.

For some strata, there has been no recent observer coverage, and thus regional and annual estimates of bycatch are potentially negatively biased. The most glaring omission is the generally low current and historical coverage of the offshore areas including the TUN, and TUS regions. Observer coverage in the CAR was also low during 2003. These offshore strata traditionally have low levels of observer coverage, and therefore it is currently unknown if there are significant interactions with protected species in these sectors of the longline fishery.

The delta estimator was applied to calculate bycatch rates primarily to maintain consistency with previous estimates for this fishery (Johnson *et al.*, 1999, Yeung, 1999a; Yeung, 1999b; Yeung, 2001). This approach assumes 1) that catch rates (animals per hook) are lognormally distributed and 2) that the number of hooks is an appropriate unit of effort. The first assumption was critically examined for turtles in Johnson *et al.* (1999); however, is difficult to verify for marine mammals given the generally low rate of these interactions. The delta estimator is sensitive to the assumption of log-normality, and

violations of this assumption may result in biased (positive or negative) estimates of catch rate and associated variances. The current approach assumes that total bycatch is linearly related to the total number of hooks fished. If this assumption is not correct, for example if there are saturation effects resulting in a non-linear relationship between the number of hooks and total catch, then there is potentially a direct bias in the estimate of total bycatch. This assumption is currently being evaluated along with other potential units of effort and statistical approaches to avoid bias and improve precision in bycatch estimates for the pelagic longline fleet.

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List of Tables and Figures

Table 1. Total amount of fishing effort reported to the pelagic longline logbook program during 2003 by quarter and fishing area (Figure 1). Fishing effort is reported as A) Number of Hooks and B) Number of sets.

Table 2. Pelagic longline fishing effort observed during 2003 by quarter and fishing area (Figure 1). Fishing effort is reported as A) Number of Hooks and B) Number of sets.

Table 3. Percentage of reported fishing effort observed during 2003 by quarter and fishing area (Figure 1) by A) Number of Hooks and B) Number of sets.

Note that the level of observed coverage in the NED fishing area essentially equaled the level of reported effort. The observer coverage during these periods was 100% of total actual fishing effort associated with an experiment to investigate factors affecting the rate of fishery interactions with sea turtles. Dashes indicate no reported fishing effort. Cells in which >10 longline sets were reported with no observer coverage are indicated in bold.

Table 4. Total number of observed interactions with A) marine mammals and B) marine turtles in the pelagic longline fishery during 2003 by quarter and fishing area. Dashes indicate areas where there was no observed fishing effort, and an x indicates areas with effort but no observations.

Table 5. Summary of release condition and serious injury types for marine mammals in the pelagic longline fishery during 2003. Serious injury determinations were based upon written observer comments. "Entangled" indicates that the animal was released with > 6 feet of gear remaining attached.

Table 6. Summary of (A) release condition, (B) and hook location in hooked animals, (C) gear recovery in unhooked animals, and (D) hook locations for animals hooked internally for marine turtles in the pelagic longline fishery during 2003. Hook location information is recorded on the sea turtle life history form (Appendix A) by the observer.

Table 7. Estimated (A) mortality, (B) serious injury, (C) live releases, and (D) total interactions for marine mammals in the pelagic longline fishery during 2003 stratified by quarter and fishing area. Since observed coverage in the NED area was equal to the total fishing effort, the observed interactions represent the total of all interactions for the experimental fishery.

Table 8. Estimated (A) mortalities, (B) live releases, and (C) total interactions for marine turtles in the pelagic longline fishery during 2003 stratified by quarter and fishing area. Since observed coverage in the NED area was equal to the total fishing effort, the observed interactions represent the total interactions for the experimental fishery.

Table 9. Estimated interactions in the pelagic longline fishery for strata with reported effort but no observer coverage during 2003. Bycatch rates are the average of the stratum rates during the previous five years when observer coverage occurred. Estimates are presented only for strata with observed bycatch of each species.

Table 10. Total mortalities and serious injuries of marine mammals in pelagic longline sets during 2003. Mortality from pelagic longline fishery is estimated by summing across individual strata estimates and estimates from unobserved strata. Serious injury, mortality, and live releases from the NED experimental fishery reflect total bycatch during 100% observer coverage.

Table 11. Estimated interactions with marine turtles in pelagic longline sets during 2003 for (A) Leatherback turtles and (B) Loggerhead turtles summarized by geographic area. Interactions for the NED experimental fishery are the total observed. All turtles captured during experimental sets were released alive.

Figure 1. Pelagic longline fishing areas in the North Atlantic Ocean indicating 11 defined fishing areas. CAR = Caribbean, GOM = Gulf of Mexico, FEC = Florida East Coast, SAB = South Atlantic Bight, SAR = Sargasso Sea, MAB = Mid-Atlantic bight, NEC = Northeast Coastal, NED = Northeast Distant, NCA = North Central Atlantic, TUN = Tuna North, TUS = Tuna South. Pelagic longline closed areas are indicated by shaded polygons and letter labels (A-E).

Figure 2. Pelagic longline fishing effort during 2003. Locations of observed (dark circles) and reported (light circles) sets are indicated.

Figure 3. Marine mammal takes during pelagic longline fishing effort during 2003. Observed sets with no mammal takes are indicated by light circles.

Figure 4. Marine turtle takes during pelagic longline fishing effort during 2003. Observed sets with no turtle takes are indicated by light circles.

Table 1. Total amount of fishing effort reported to the pelagic longline logbook program during 2003 by quarter and fishing area (Figure 1). Fishing effort is reported as A) Number of Hooks and B) Number of sets.

A. Number of sets.

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	143	404	1099	97	105	0	0	113	101	41	4	2107
2	17	230	1510	174	61	91	4	484	20	1	22	2614
3	0	117	1446	306	0	334	395	167	0	0	0	2765
4	58	124	1046	384	0	132	136	129	10	0	0	2019
Total	218	875	5101	961	166	557	535	893	131	42	26	9505

B. Number of hooks (x1000)

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	85.0	271.8	856.2	61.2	80.6	0	0	82.4	86.5	40.4	4.2	1568.2
2	10.5	134.9	1118.4	107.2	51.6	67.5	3.7	324.1	18.6	1.1	22.9	1860.4
3	0	44.1	1074.4	220.1	0	271.5	420.5	66.0	0	0	0	2096.5
4	39.2	46.7	761.8	303.0	0	109.5	152.5	62.7	7.7	0	0	1483.0
Total	134.6	497.4	3810.8	691.4	132.2	448.4	576.7	535.1	112.8	41.5	27.1	7008.1

Table 2. Pelagic longline fishing effort observed during 2003 by quarter and fishing area (Figure 1). Fishing effort is reported as A) Number of Hooks and B) Number of sets.

a. Number of Sets

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	4	44	76	6	14	-	-	10	17	0	0	171
2	0	7	73	6	31	4	4	21	1	0	0	147
3	-	7	54	37	-	21	398	19	-	-	-	536
4	0	4	64	21	-	11	134	0	0	-	-	234
Total	4	62	267	70	45	36	536	50	18	0	0	1088

b. Number of Hooks (x1000)

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	2.4	36.6	65.7	3.5	14.3	-	-	7.7	15.7	0	0	145.9
2	0	2.4	47.3	4.1	25.3	3.0	3.7	16.6	0.8	0	0	103.2
3	-	2.8	45.5	32.9	-	17.2	424.2	8.2	-	-	-	530.9
4	0	1.5	52.4	18.2	-	12.3	150.1	0	0	-	-	234.5
Total	2.4	43.3	211.0	58.6	39.6	32.6	578.1	32.5	16.5	0	0	1014.6

Table 3. Percentage of reported fishing effort observed during 2003 by quarter and fishing area (Figure 1) by A) Number of Hooks and B) Number of sets. Note that the level of observed coverage in the NED fishing area essentially equaled the level of reported effort. The observer coverage during these periods was 100% of total actual fishing effort associated with an experiment to investigate factors affecting the rate of fishery interactions with sea turtles. Dashes indicate no reported fishing effort. Cells in which >10 longline sets were reported with no observer coverage are indicated in bold.

a. Percent observed of total sets

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	2.80	10.89	6.92	6.19	13.33	-	-	8.85	16.83	0.00	0.00	8.12
2	0.00	3.04	4.83	3.45	50.82	4.40	100.00	4.34	5.00	0.00	0.00	5.62
3	-	5.98	3.73	12.09	-	6.29	100.76	11.38	-	-	-	19.39
4	0.00	3.23	6.12	5.47	-	8.33	98.53	0.00	0.00	-	-	11.59
Total	1.83	7.09	5.23	7.28	27.11	6.46	100.19	5.60	13.74	0.00	0.00	11.45

b. Percent observed of total hooks (x1000)

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	2.84	13.47	7.68	5.68	17.76	-	-	9.34	18.16	0.00	0.00	9.31
2	0.00	1.79	4.23	3.79	48.96	4.51	100.00	5.11	4.37	0.00	0.00	5.55
3	-	6.41	4.24	14.96	-	6.35	100.88	12.44	-	-	-	25.32
4	0.00	3.16	6.88	5.99	-	11.28	98.44	0.00	0.00	-	-	15.81
Total	1.79	8.71	5.54	8.48	29.95	7.28	100.23	6.06	14.65	0.00	0.00	14.48

Table 4. Total number of observed interactions with A) marine mammals and B) marine turtles in the pelagic longline fishery during 2003 by quarter and fishing area. Dashes indicate areas where there was no observed fishing effort, and an x indicates areas with effort but no observations.

a. Marine mammals

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	1	0	1	0	0	-	-	0	1	x	x	3
2	x	0	0	1	1	1	0	0	0	x	x	3
3	-	0	0	6	-	1	6	0	-	-	-	13
4	x	0	0	4	-	4	1	x	x	-	-	9
Total	1	0	1	11	1	6	7	0	1	x	x	28

b. Total sea turtles

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	1	12	12	2	5	-	-	3	13	x	x	48
2	x	0	9	3	7	8	4	2	0	x	x	33
3	-	0	8	1	-	5	96	1	-	-	-	111
4	x	2	30	1	-	7	72	x	x	-	-	112
Total	1	14	59	7	12	20	172	6	13	x	x	304

c. Leatherbacks

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	0	4	11	1	0	-	-	3	0	x	x	19
2	x	0	7	3	1	1	3	0	0	x	x	15
3	-	0	5	0	-	1	66	1	-	-	-	73
4	x	0	28	0	-	5	10	x	x	-	-	43
Total	0	4	51	4	1	7	79	4	0	x	x	150

Table 4 continued

d. Loggerheads

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	1	8	1	1	5	-	-	0	13	x	x	29
2	x	0	2	0	6	7	1	2	0	x	x	18
3	-	0	2	1	-	4	30	0	-	-	-	37
4	x	2	2	0	-	2	61	x	x	-	-	67
Total	1	10	7	2	11	13	92	2	13	x	x	151

e. Other turtles

Quarter	CAR	FEC	GOM	MAB	NCA	NEC	NED	SAB	SAR	TUN	TUS	Total
1	0	0	0	0	0	-	-	0	0	x	x	0
2	x	0	0	0	0	0	0	0	0	x	x	0
3	-	0	1 Un-id	0	-	0	0	0	-	-	-	1
4	x	0	0	1 Un-id	-	0	1 Olive Ridley	x	x	-	-	2
Total	0	0	1	1	0	0	1	0	0	x	x	3

Table 5. Summary of release condition and serious injury types for marine mammals in the pelagic longline fishery during 2003. Serious injury determinations were based upon written observer comments. “Entangled” indicates that the animal was released with > 6 feet of gear remaining attached.

Species	Alive	Dead	Serious Injury			Serious injury total	total takes
			Mouth hooked	Entangled	Mouth Hooked & entangled		
Beaked Whale	1	0	0	1	0	1	2
Dolphin	0	0	0	0	1	1	1
Dolphin Atlantic Spotted	0	0	0	0	1	1	1
Dolphin Bottlenose	1	0	0	0	0	0	1
Dolphin Common	2	0	0	0	0	0	2
Dolphin Rissos	10	1	1	2	0	3	14
Dolphin Striped	1	0	0	0	0	0	1
Pilot Whale	2	0	0	2	0	2	4
Whale Baleen	1	0	0	0	0	0	1
Whale Minke	1	0	0	0	0	0	1
Totals	19	1	1	5	2	8	28

Table 6. Summary of (A) release condition, (B) and hook location in hooked animals, (C) gear recovery in unhooked animals, and (D) hook locations for animals hooked internally for marine turtles in the pelagic longline fishery during 2003. Hook location information is recorded on the sea turtle life history form (Appendix A) by the observer.

a) Release condition

Species	Alive, injured	Alive, uninjured	Alive, unknown	Fresh dead	Total
Leatherback	119	26	4	1	149
Loggerhead	149	1	1	0	151
Olive Ridley	1	0	0	0	1
Un-identified	1	0	1	0	2
Totals	270	27	6	1	304

b) Hook Location

Species	Hooked			Internal			External				
	not hooked	unknown if hooked	hooked, location unknown	unknown internal	swallowed	beak/mouth/ tongue/ glottis	unknown external	beak/head /neck	carapace/ plastron	front flipper /shoulder/ armpit	rear flipper/groin/ tail
Leatherback	29	6	4 (gear left on 3 of 4)	0	0	6	9 (gear left on 8 of 9)	2	10	83	1
Loggerhead	1	1	1 (10' gear left)	2	71	66	0	1	0	7	1
Olive Ridley	0	0	0	0	0	1	0	0	0	0	0
Un-identified	0	1	1 (60' gear left)	0	0	0	0	0	0	0	0
Totals	30	8	6	2	71	73	9	3	10	90	2

Table 6 continued

c) Gear recovery in unhooked animals

Species	not hooked/ all gear retrieved	not hooked/ gear not retrieved	not known if hooked/ all gear retrieved	not known if hooked/ gear not retrieved
Leatherback	27	2	3	3
Loggerhead	1	0	1	0
Olive Ridley	0	0	0	0
Un-identified	0	0	1	0
Totals	28	2	5	3

d) Hook locations for animals hooked internally.

Species	Exact Location				
	Unknown	Glottis	Mouth Internal	Beak Internal	Tongue
Leatherback	0	0	4	2	0
Loggerhead	13	1	29	15	10
Olive Ridley	0	0	0	0	1
Un-identified	0	0	0	0	0
Totals	13	1	33	17	11

Table 7. Estimated (A) mortality, (B) serious injury, (C) live releases, and (D) total interactions for marine mammals in the pelagic longline fishery during 2003 stratified by quarter and fishing area. Since observed coverage in the NED area was equal to the total fishing effort, the observed interactions represent the total of all interactions for the experimental fishery.

a. Mortalities

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	N	CV est
Dolphin Rissos	3	NED	1	398	420.5	-	-	1.0	-

b. Serious injuries

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	Extrapolated N	CV est
Beaked Whale	1	SAR	1	17	86.5	0.0613	0.0038	5.3	1.000
Dolphin	1	GOM	1	76	856.2	0.0189	0.0004	16.2	1.000
Dolphin Alantic Spotted	2	MAB	1	6	107.2	0.2778	0.0772	29.8	1.000
Dolphin Rissos	3	MAB	1	37	220.1	0.0270	0.0007	5.9	1.000
Dolphin Rissos	3	NEC	1	21	271.5	0.0500	0.0025	13.6	1.000
Dolphin Rissos	4	MAB	1	21	303.0	0.0680	0.0046	20.6	1.000
Pilot Whale	3	MAB	2	37	220.1	0.0971	0.0057	21.4	0.775

Table 7 continued

c. Released alive

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	Extrapolated	
								N	CV est
Beaked Whale	1	CAR	1	4	85.0	0.4762	0.2268	40.5	1.000
Dolphin Bottlenose	2	NCA	1	31	51.6	0.0384	0.0015	2.0	1.000
Dolphin Common	3	MAB	1	37	220.1	0.0347	0.0012	7.6	1.000
Dolphin Common	4	MAB	1	21	303.0	0.1253	0.0157	38.0	1.000
Dolphin Rissos	3	NED	3	398	420.5	-	-	3.0	-
Dolphin Rissos	4	MAB	2	21	303.0	0.0953	0.0043	28.9	0.689
Dolphin Rissos	4	NEC	4	11	109.5	0.3248	0.0185	35.6	0.419
Dolphin Rissos	4	NED	1	134	152.5	-	-	1.0	-
Dolphin Striped	3	NED	1	398	420.5	-	-	1.0	-
Pilot Whale	3	MAB	2	37	220.1	0.0512	0.0013	11.3	0.697
Whale Baleen	3	NED	1	398	420.5	-	-	1.0	-
Whale Minke	2	NEC	1	4	67.5	0.3307	0.1094	22.3	1.000

Table 7 continued

d. Total interactions

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	Extrapolated N	CV est
Beaked Whale	1	CAR	1	4	85.0	0.4762	0.2268	40.5	1.000
Beaked Whale	1	SAR	1	17	86.5	0.0613	0.0038	5.3	1.000
Dolphin	1	GOM	1	76	856.2	0.0189	0.0004	16.2	1.000
Dolphin Alantic Spotted	2	MAB	1	6	107.2	0.2778	0.0772	29.8	1.000
Dolphin Bottlenose	2	NCA	1	31	51.6	0.0384	0.0015	2.0	1.000
Dolphin Common	3	MAB	1	37	220.1	0.0347	0.0012	7.6	1.000
Dolphin Common	4	MAB	1	21	303.0	0.1253	0.0157	38.0	1.000
Dolphin Rissos	3	MAB	1	37	220.1	0.0270	0.0007	5.9	1.000
Dolphin Rissos	3	NEC	1	21	271.5	0.0500	0.0025	13.6	1.000
Dolphin Rissos	3	NED	4	398	420.5	-	-	4.0	-
Dolphin Rissos	4	MAB	3	21	303.0	0.1632	0.0083	49.4	0.557
Dolphin Rissos	4	NEC	4	11	109.5	0.3248	0.0185	35.6	0.419
Dolphin Rissos	4	NED	1	134	152.5	-	-	1.0	-
Dolphin Striped	3	NED	1	398	420.5	-	-	1.0	-
Pilot Whale	3	MAB	4	37	220.1	0.1458	0.0059	32.1	0.527
Whale Baleen	3	NED	1	398	420.5	-	-	1.0	-
Whale Minke	2	NEC	1	4	67.5	0.3307	0.1094	22.3	1.000

Table 8. Estimated (A) mortalities, (B) live releases, and (C) total interactions for marine turtles in the pelagic longline fishery during 2003 stratified by quarter and fishing area. Since observed coverage in the NED area was equal to the total fishing effort, the observed interactions represent the total interactions for the experimental fishery.

a. Mortalities

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	Extrapolated N	CV est
Leatherback	2	GOM	1	73	1118.4	0.0337	0.0011	37.7	1.000

b. Released alive

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var CPUE	Extrapolated N	CV est
Leatherback	1	FEC	3	44	271.8	0.1006	0.0039	27.3	0.620
Leatherback	1	GOM	10	76	856.2	0.1653	0.0026	141.5	0.306
Leatherback	1	MAB	1	6	61.2	0.1890	0.0357	11.6	1.000
Leatherback	1	SAB	2	10	82.4	0.7440	0.2583	61.3	0.683
Leatherback	2	GOM	6	73	1118.4	0.1526	0.0044	170.7	0.434
Leatherback	2	MAB	2	6	107.2	0.7680	0.2630	82.3	0.668
Leatherback	2	NCA	1	31	51.6	0.0384	0.0015	2.0	1.000
Leatherback	2	NEC	1	4	67.5	0.3053	0.0932	20.6	1.000
Leatherback	2	NED	3	4	3.7	-	-	3.0	-
Leatherback	3	GOM	4	54	1074.4	0.1113	0.0032	119.6	0.507
Leatherback	3	NEC	1	21	271.5	0.0425	0.0018	11.5	1.000
Leatherback	3	NED	49	398	420.5	-	-	66.0	-
Leatherback	3	SAB	1	19	66.0	0.0914	0.0083	6.0	1.000
Leatherback	4	GOM	17	64	761.8	0.4832	0.0139	368.1	0.244
Leatherback	4	NEC	5	11	109.5	0.4007	0.0193	43.9	0.347
Leatherback	4	NED	8	134	152.5	-	-	10.0	-
Loggerhead	1	CAR	1	4	85.0	0.2894	0.0837	24.6	1.000
Loggerhead	1	FEC	7	44	271.8	0.2619	0.0104	71.2	0.390
Loggerhead	1	GOM	1	76	856.2	0.0137	0.0002	11.7	1.000
Loggerhead	1	MAB	1	6	61.2	0.1890	0.0357	11.6	1.000

Table 8b continued

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var		CV est
							CPUE	Extrapolated N	
Loggerhead	1	NCA	3	14	80.6	0.3339	0.0406	26.9	0.604
Loggerhead	1	SAR	8	17	86.5	0.8096	0.0684	70.1	0.323
Loggerhead	2	GOM	2	73	1118.4	0.0423	0.0009	47.3	0.708
Loggerhead	2	NCA	4	31	51.6	0.2324	0.0135	12.0	0.500
Loggerhead	2	NEC	2	4	67.5	2.4735	2.1992	166.9	0.600
Loggerhead	2	NED	1	4	3.7	-	-	1.0	-
Loggerhead	2	SAB	2	21	324.1	0.1364	0.0088	44.2	0.689
Loggerhead	3	GOM	2	54	1074.4	0.0455	0.0010	48.9	0.700
Loggerhead	3	MAB	1	37	220.1	0.0279	0.0008	6.1	1.000
Loggerhead	3	NEC	4	21	271.5	0.2102	0.0096	57.1	0.465
Loggerhead	3	NED	23	398	420.5	-	-	30.0	-
Loggerhead	4	FEC	2	4	46.7	1.4029	0.6692	65.5	0.583
Loggerhead	4	GOM	2	64	761.8	0.0352	0.0006	26.8	0.702
Loggerhead	4	NEC	2	11	109.5	0.1579	0.0112	17.3	0.671
Loggerhead	4	NED	18	134	152.5	-	-	61.0	-
Olive Ridley	4	NED	1	134	152.5	-	-	1.0	-
un-id	3	GOM	1	54	1074.4	0.0207	0.0004	22.2	1.000
un-id	4	MAB	1	21	303.0	0.0486	0.0024	14.7	1.000

c. Total interactions

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Mean CPUE	Var		CV est
							CPUE	Extrapolated N	
Leatherback	1	FEC	3	44	271.8	0.1006	0.0039	27.3	0.620
Leatherback	1	GOM	10	76	856.2	0.1653	0.0026	141.5	0.306
Leatherback	1	MAB	1	6	61.2	0.1890	0.0357	11.6	1.000
Leatherback	1	SAB	2	10	82.4	0.7440	0.2583	61.3	0.683
Leatherback	2	GOM	7	73	1118.4	0.1871	0.0055	209.2	0.398
Leatherback	2	MAB	2	6	107.2	0.7680	0.2630	82.3	0.668
Leatherback	2	NCA	1	31	51.6	0.0384	0.0015	2.0	1.000
Leatherback	2	NEC	1	4	67.5	0.3053	0.0932	20.6	1.000

Table 8c continued

Species	Quarter	Fishing area	#Positive Sets	# Observed sets	# Hooks reported (x1000)	Var		Extrapolated N	CV est
						Mean CPUE	CPUE		
Leatherback	2	NED	3	4	3.7	-	-	3.0	-
Leatherback	3	GOM	4	54	1074.4	0.1113	0.0032	119.6	0.507
Leatherback	3	NEC	1	21	271.5	0.0425	0.0018	11.5	1.000
Leatherback	3	NED	49	398	420.5	-	-	66.0	-
Leatherback	3	SAB	1	19	66.0	0.0914	0.0083	6.0	1.000
Leatherback	4	GOM	17	64	761.8	0.4832	0.0139	368.1	0.244
Leatherback	4	NEC	5	11	109.5	0.4007	0.0193	43.9	0.347
Leatherback	4	NED	8	134	152.5	-	-	10.0	-
Loggerhead	1	CAR	1	4	85.0	0.2894	0.0837	24.6	1.000
Loggerhead	1	FEC	7	44	271.8	0.2619	0.0104	71.2	0.390
Loggerhead	1	GOM	1	76	856.2	0.0137	0.0002	11.7	1.000
Loggerhead	1	MAB	1	6	61.2	0.1890	0.0357	11.6	1.000
Loggerhead	1	NCA	3	14	80.6	0.3339	0.0406	26.9	0.604
Loggerhead	1	SAR	8	17	86.5	0.8096	0.0684	70.1	0.323
Loggerhead	2	GOM	2	73	1118.4	0.0423	0.0009	47.3	0.708
Loggerhead	2	NCA	4	31	51.6	0.2324	0.0135	12.0	0.500
Loggerhead	2	NEC	2	4	67.5	2.4735	2.1992	166.9	0.600
Loggerhead	2	NED	1	4	3.7	-	-	1.0	-
Loggerhead	2	SAB	2	21	324.1	0.1364	0.0088	44.2	0.689
Loggerhead	3	GOM	2	54	1074.4	0.0455	0.0010	48.9	0.700
Loggerhead	3	MAB	1	37	220.1	0.0279	0.0008	6.1	1.000
Loggerhead	3	NEC	4	21	271.5	0.2102	0.0096	57.1	0.465
Loggerhead	3	NED	23	398	420.5	-	-	30.0	-
Loggerhead	4	FEC	2	4	46.7	1.4029	0.6692	65.5	0.583
Loggerhead	4	GOM	2	64	761.8	0.0352	0.0006	26.8	0.702
Loggerhead	4	NEC	2	11	109.5	0.1579	0.0112	17.3	0.671
Loggerhead	4	NED	18	134	152.5	-	-	61.0	-
Olive Ridley	4	NED	1	134	152.5	-	-	1.0	-
un-id	3	GOM	1	54	1074.4	0.0207	0.0004	22.2	1.000
un-id	4	MAB	1	21	303.0	0.0486	0.0024	14.7	1.000

Table 9. Estimated interactions in the pelagic longline fishery for strata with reported effort but no observer coverage during 2003. Bycatch rates are the average of the stratum rates during the previous five years when observer coverage occurred. Estimates are presented only for strata with observed bycatch of each species.

species	Quarter	Fishing Area	# positive sets (1998-2002)	# observed sets (1998-2002)	Type	2003 Reported Effort (Hooks x1000)	Mean CPUE	Var Cpue	Extrapolated	
									N	CV N
Beaked Whale	4	CAR	1	20	Alive	39.2	0.0772	0.0060	3.0	1.000
Leatherback	4	SAB	2	57	Alive	62.7	0.1294	0.0083	8.1	0.702
Loggerhead	4	CAR	3	20	Alive	39.2	0.2865	0.0256	11.2	0.558
Loggerhead	4	SAB	3	57	Alive	62.7	0.1290	0.0055	8.1	0.574

Table 10. Total mortalities and serious injuries of marine mammals in pelagic longline sets during 2003. Mortality from pelagic longline fishery is estimated by summing across individual strata estimates and estimates from unobserved strata. Serious injury, mortality, and live releases from the NED experimental fishery reflect total bycatch during 100% observer coverage.

a. Pelagic longline fishery effort

Species	Serious Injury CV	Serious Injury	Alive	CV Alive	Total	CV Total	95% CI
Beaked Whale	5.3	1.000	43.5	0.933	48.8	0.836	12.2 - 195.5
Dolphin	16.2	1.000	0.0	-	16.2	1.000	3.3 - 79.1
Dolphin Atlantic spotted	29.8	1.000	0.0	-	29.8	1.000	6.1 - 145.5
Dolphin Common	0.0	-	45.6	0.849	45.6	0.849	11.2 - 185.7
Dolphin Rissos	40.1	0.633	64.4	0.386	104.5	0.331	56.5 - 193.4
Pilot Whale	21.4	0.775	11.3	0.697	32.1	0.527	12.5 - 82.5
Whale Minke	0.0	-	22.3	1.000	22.3	1.000	4.6 - 109.0

b. NED

	Mortality	Alive
Dolphin Rissos	1	4
Dolphin Striped	0	1
Whale Baleen	0	1

Table 11. Estimated interactions with marine turtles in pelagic longline sets during 2003 for (A) Leatherback turtles and (B) Loggerhead turtles summarized by geographic area. Interactions for the NED experimental fishery are the total observed. All turtles captured during experimental sets were released alive.

a. Leatherbacks

Area	Dead	Dead CV	Alive	Alive CV	Total	Total CV	Total 95% confidence interval
FEC			27.3	0.620	27.3	0.620	9.2 - 81.0
GOM	37.7	1.000	799.9	0.173	838.4	0.171	606.6 - 1158.9
MAB			93.9	0.598	93.9	0.598	32.7 - 269.4
NCA			2.0	1.000	2.0	1.000	0.4 - 9.7
NEC			76.0	0.369	76.0	0.369	38.4 - 150.3
SAB			75.4	0.566	75.4	0.566	27.6 - 205.9
Total	37.7	1.000	1074.5	0.148	1112.3	0.147	842.3 - 1468.8
NED			79	-	79	-	-

b. Loggerheads

Area	Alive	Alive CV	95% confidence interval
CAR	35.8	0.709	10.6 - 120.8
FEC	136.7	0.345	72.1 - 259.1
GOM	134.8	0.392	65.6 - 276.9
MAB	17.7	0.740	5.0 - 62.3
NCA	38.9	0.445	17.3 - 87.5
NEC	241.2	0.432	109.7 - 530.4
SAB	52.3	0.589	18.5 - 148.1
SAR	70.1	0.323	38.4 - 127.7
Totals	727.4	0.187	511.2 - 1035.1
NED	92	-	-

c. Other turtles

Species	Area	Alive	Alive CV	95% confidence interval
Un-id	GOM	22.2	1.000	4.5 - 108.5
Un-id	MAB	14.7	1.000	3.0 - 72.0
Total		36.9	0.721	10.8 - 126.8
Olive Ridley	NED	1.0	-	-

Figure 1. Pelagic longline fishing areas in the north Atlantic ocean indicating 11 defined fishing areas. CAR = Caribbean, GOM = Gulf of Mexico, FEC = Florida East Coast, SAB = South Atlantic Bight, SAR = Sargasso Sea, MAB = Mid-Atlantic bight, NEC = Northeast Coastal, NED = Northeast Distant, NCA = North Central Atlantic, TUN = Tuna North, TUS = Tuna South. Pelagic longline closed areas are indicated by shaded polygons and letter labels (A-E).

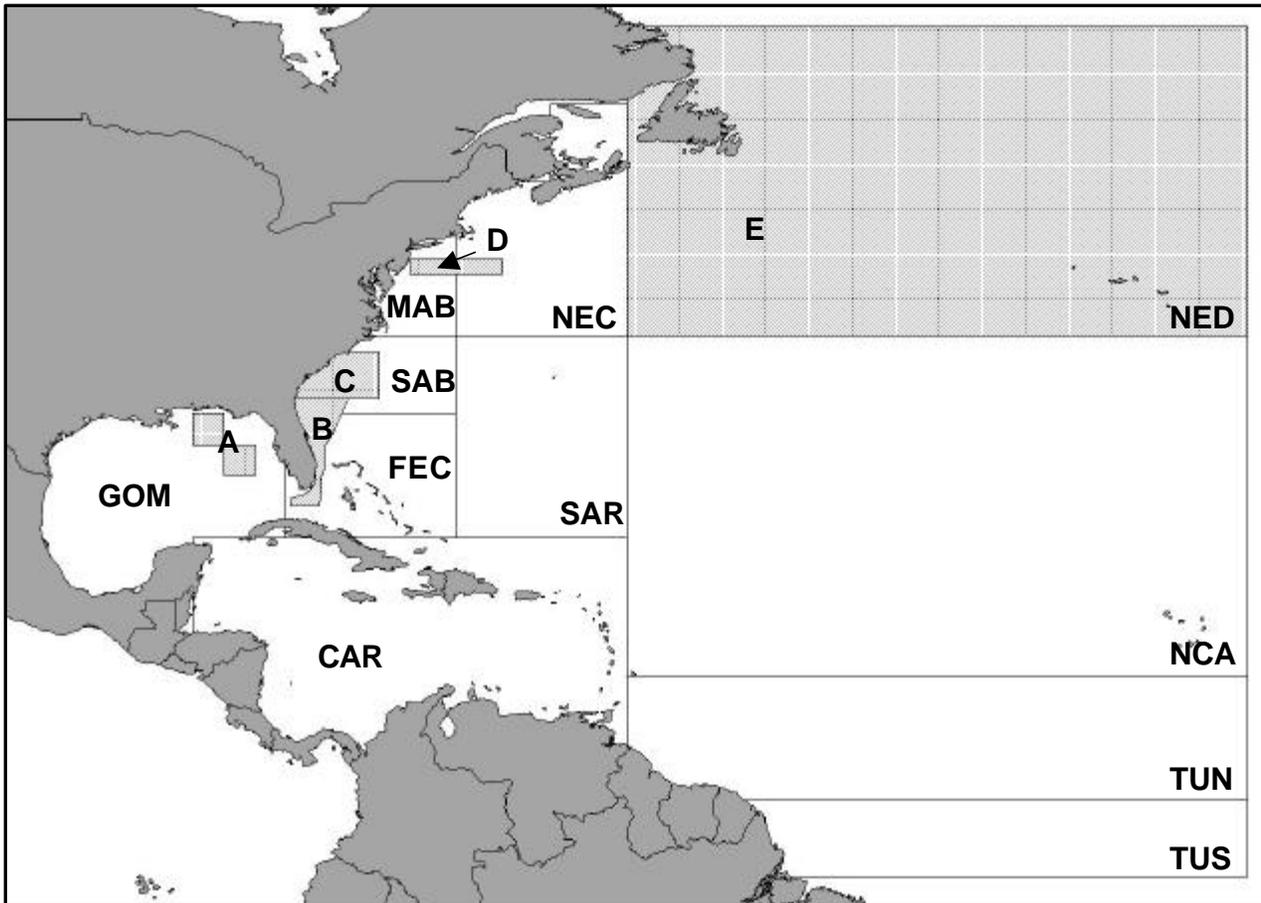


Figure 2: Pelagic longline fishing effort during 2003. Locations of observed (dark circles) and reported (light circles) sets are indicated.

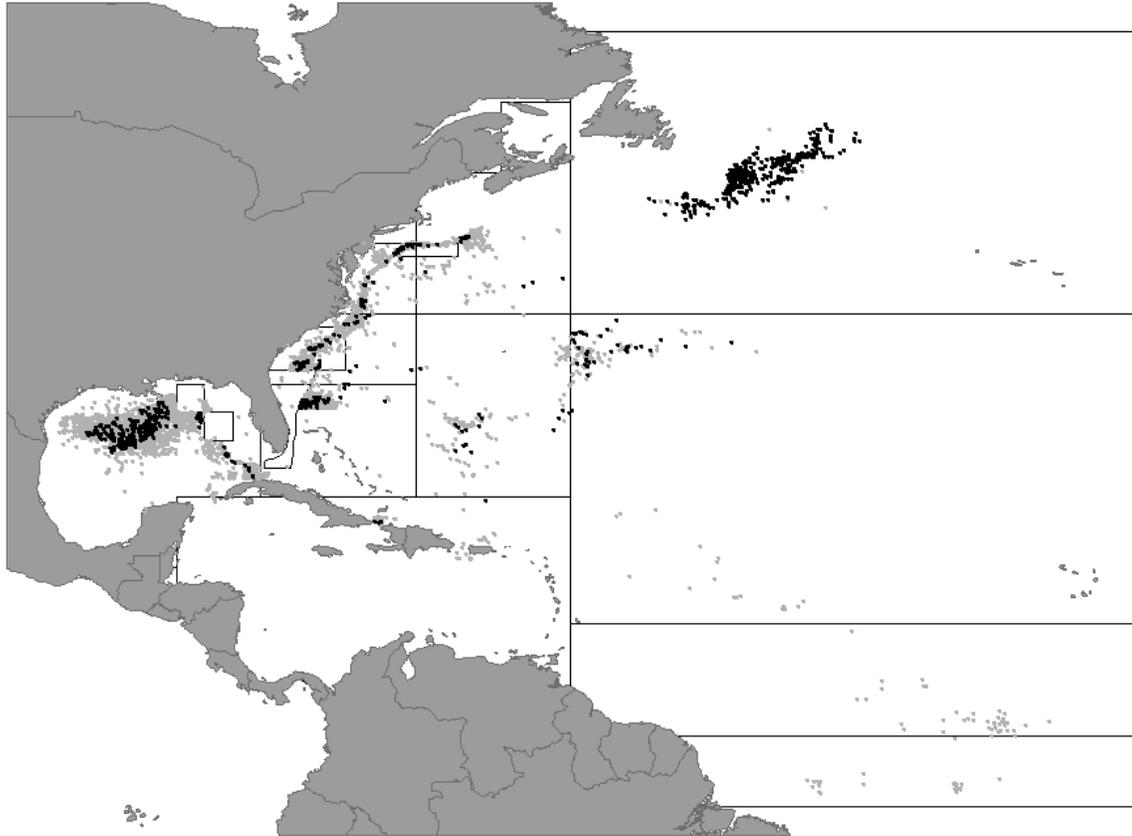


Figure 3: Marine mammal takes (dark circles) during pelagic longline fishing effort during 2003. Observed sets with no mammals takes are indicated by light circles.

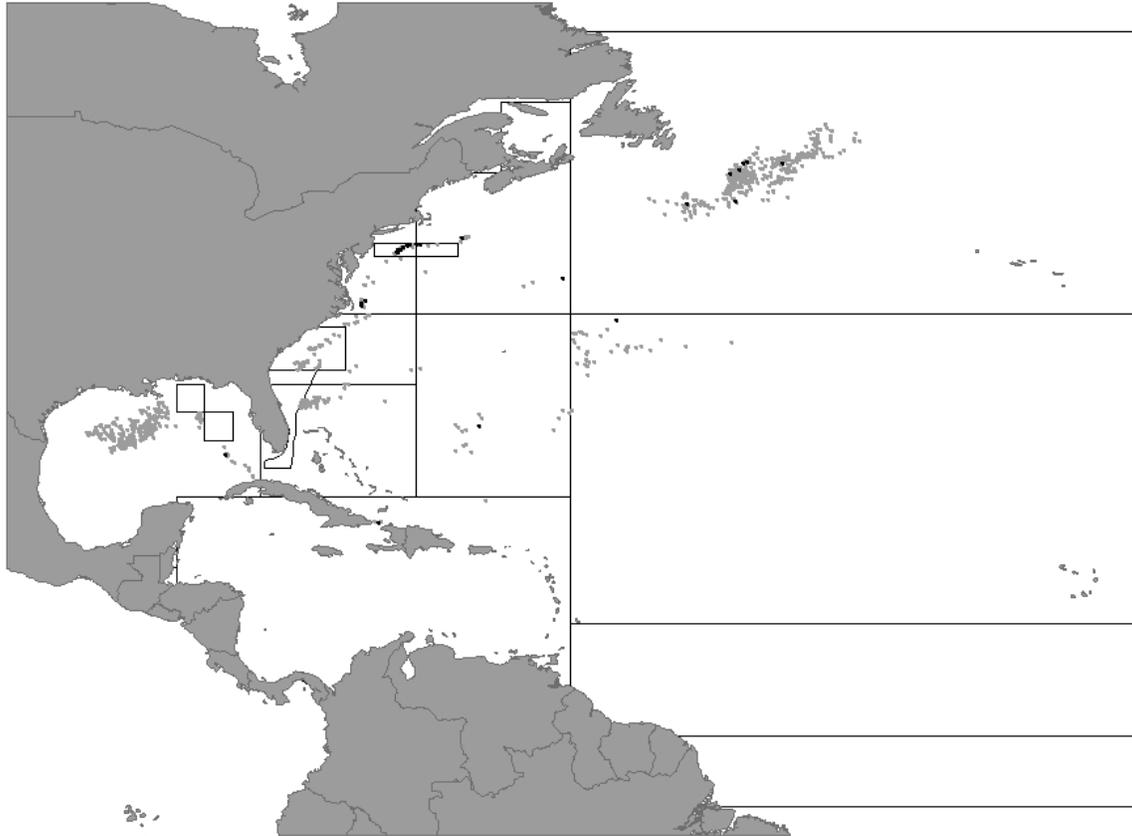
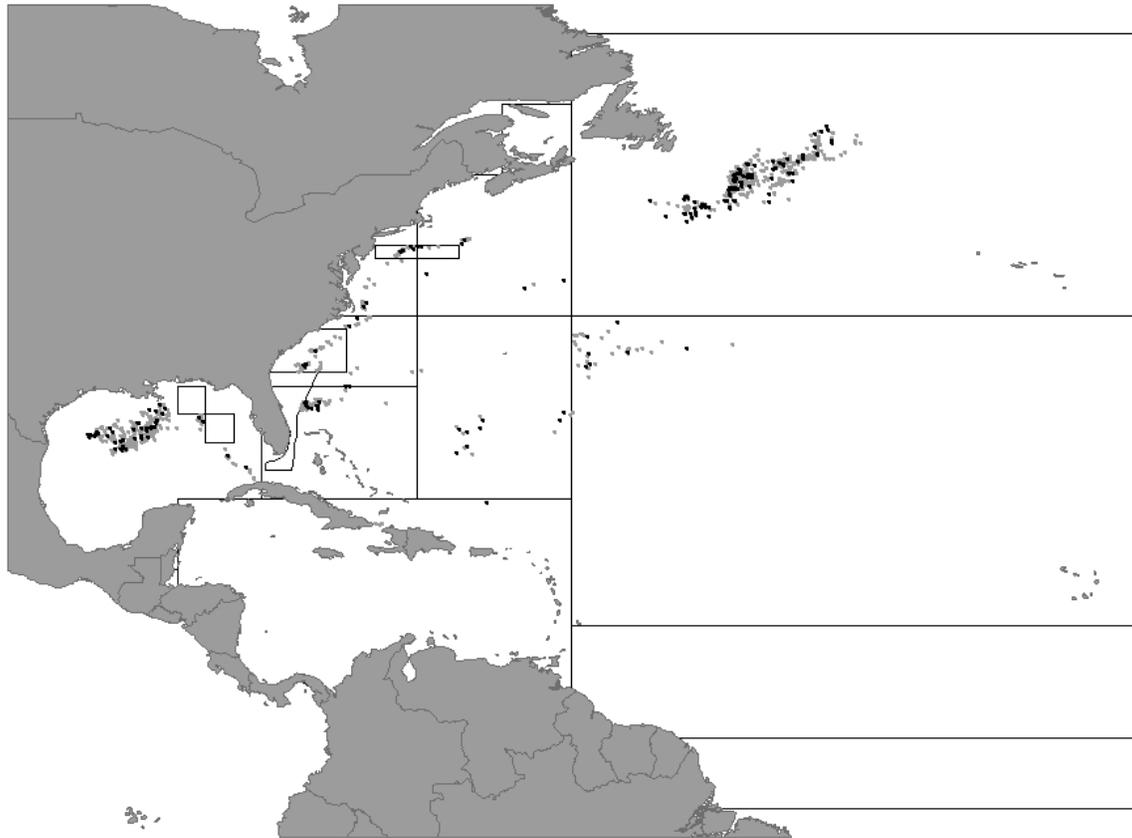


Figure 4: Marine turtle takes (dark circles) during pelagic longline fishing effort during 2003. Observed sets with no turtle takes are indicated by light circles.



Appendix A. Sea Turtle Life History Form

SEA TURTLE LIFE HISTORY FORM

4503

CAPTURE INFORMATION

TRIP YEAR 20 MONTH DAY

SET/HAUL/TOW SPECIMEN NUMBER BY TRIP

GEAR TYPE: Longline Gill Net Trawl
 GEAR DEPTH: Surface Midwater Bottom

TIME (24 hr) WATER TEMP (°F) .

LATITUDE deg min N / S LONGITUDE deg min E / W

Did turtle slide out/escape from gear? Y / N Was turtle brought on board? Y / N

Was light stick on hook? Y / N / U Color? White, Pink, Blue, Green, Black, Red, Yellow, Purple, Other, Unknown

If No, number of gangions to next light stick
 Color? White, Pink, Blue, Green, Black, Red, Yellow, Purple, Other, Unknown

Number of gangions to next float

IDENTIFICATION (see back)

Number of Photos Taken?

SPECIES: Leatherback Loggerhead Kemp's ridley Green Hawksbill Olive ridley
 Unidentified Hardshell Unknown

CONDITION OF TURTLE

Previously dead Fresh dead Comatose (resuscitated) Other (describe)
 Alive, injured (describe) Alive, uninjured Alive, unknown Unknown (describe)

HOOK LOCATION

(circle specific location; check box if specifics are not known; annotate drawing on reverse to indicate location as needed):

Not Hooked Not Known if Hooked Hooked, but location totally Unknown

Internal: Unknown, internal Ingested (Esophagus)
 Beak/Mouth/Tongue/Glottis - note location in jaw: upper lower side other (describe)

External: Unknown, external Beak/Head/Neck Carapace/Plastron
 Front Flipper/Shoulder/Armpit Rear Flipper/Groin/Tail

Was hook removed from this animal? Y / N / Not Applicable

Was animal entangled in gear? Y / N / Unknown

How much gear (linear feet) was left on turtle when released? ft. (estimated/measured)

Estimated carapace length (notch-to-tip straight line): ft (needed only if turtle is not boated & measured)

Appendix B: Observed interactions for individual longline sets in 2003.

Table B1. Observed interactions per longline set with marine mammals by species, quarter, and fishing area. The number of hooks per set is reported along with the release status of animals.

Month	Quarter	Fishing area	# Hooks	Species	Caught	Dead	Serious injury
2	1	CAR	525	Beaked Whale	1	0	0
2	1	SAR	960	Beaked Whale	1	0	1
1	1	GOM	696	Dolphin	1	0	1
6	2	MAB	600	Dolphin Alantic Spotted	1	0	1
4	2	NCA	840	Dolphin Bottlenose	1	0	0
8	3	MAB	780	Dolphin Common	1	0	0
10	4	MAB	380	Dolphin Common	1	0	0
9	3	MAB	1000	Dolphin Rissos	1	0	1
10	4	MAB	980	Dolphin Rissos	1	0	0
11	4	MAB	700	Dolphin Rissos	1	0	1
10	4	MAB	1020	Dolphin Rissos	1	0	0
8	3	NEC	952	Dolphin Rissos	1	0	1
10	4	NEC	1080	Dolphin Rissos	1	0	0
11	4	NEC	1080	Dolphin Rissos	1	0	0
10	4	NEC	1172	Dolphin Rissos	1	0	0
11	4	NEC	1152	Dolphin Rissos	1	0	0
9	3	NED	1090	Dolphin Rissos	1	0	0
7	3	NED	1340	Dolphin Rissos	1	0	0
9	3	NED	1300	Dolphin Rissos	1	1	0
9	3	NED	1270	Dolphin Rissos	1	0	0
10	4	NED	1085	Dolphin Rissos	1	0	0
8	3	NED	1285	Dolphin Striped	1	0	0
7	3	MAB	378	Pilot Whale	1	0	1
9	3	MAB	1056	Pilot Whale	1	0	0
9	3	MAB	1056	Pilot Whale	1	0	1
9	3	MAB	1056	Pilot Whale	1	0	0
8	3	NED	1055	Whale Baleen	1	0	0
5	2	NEC	756	Whale Minke	1	0	0

Table B2. Observed interactions per longline set with marine turtles by species, quarter, and fishing area. The number of hooks in the set is reported along with the release status of animals.

Species	Quarter	Area	N Hooks	Alive	Dead
Leatherbacks	1	SAB	448	2	0
Leatherbacks	1	GOM	588	1	0
Leatherbacks	1	SAB	336	1	0
Leatherbacks	1	GOM	930	1	0
Leatherbacks	1	GOM	930	2	0
Leatherbacks	1	GOM	984	1	0
Leatherbacks	1	GOM	984	1	0
Leatherbacks	1	MAB	882	1	0
Leatherbacks	1	FEC	1125	1	0
Leatherbacks	1	FEC	950	1	0
Leatherbacks	1	GOM	960	1	0
Leatherbacks	1	GOM	848	1	0
Leatherbacks	1	FEC	792	2	0
Leatherbacks	1	GOM	880	1	0
Leatherbacks	1	GOM	890	1	0
Leatherbacks	1	GOM	860	1	0
Leatherbacks	2	GOM	800	1	0
Leatherbacks	2	NCA	840	1	0
Leatherbacks	2	GOM	406	1	1
Leatherbacks	2	GOM	555	1	0
Leatherbacks	2	GOM	768	1	0
Leatherbacks	2	GOM	528	1	0
Leatherbacks	2	GOM	980	1	0
Leatherbacks	2	NEC	819	1	0
Leatherbacks	2	GOM	248	1	0
Leatherbacks	2	MAB	680	2	0
Leatherbacks	2	MAB	600	1	0
Leatherbacks	2	NED	1008	1	0
Leatherbacks	2	NED	875	1	0
Leatherbacks	2	NED	1008	1	0
Leatherbacks	3	NED	966	7	0
Leatherbacks	3	NED	1050	1	0
Leatherbacks	3	NED	1030	1	0
Leatherbacks	3	GOM	852	1	0
Leatherbacks	3	NED	720	1	0
Leatherbacks	3	GOM	843	2	0
Leatherbacks	3	GOM	840	1	0
Leatherbacks	3	NED	900	1	0
Leatherbacks	3	SAB	576	1	0
Leatherbacks	3	NED	1155	1	0
Leatherbacks	3	NED	1150	1	0
Leatherbacks	3	NED	927	1	0
Leatherbacks	3	NED	1340	1	0
Leatherbacks	3	NED	1120	1	0
Leatherbacks	3	NED	1304	6	0
Leatherbacks	3	NED	1305	1	0

Table B2 continued

Species	Quarter	Area	N		
			Hooks	Alive	Dead
Leatherbacks	3	NED	1120	1	0
Leatherbacks	3	NED	1346	1	0
Leatherbacks	3	NED	1292	1	0
Leatherbacks	3	NED	1320	2	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	3	NEC	1120	1	0
Leatherbacks	3	NED	1435	1	0
Leatherbacks	3	NED	990	3	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	3	NED	1310	1	0
Leatherbacks	3	NED	900	1	0
Leatherbacks	3	NED	1085	1	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	3	NED	1230	1	0
Leatherbacks	3	NED	900	1	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	3	NED	1075	1	0
Leatherbacks	3	NED	1068	1	0
Leatherbacks	3	NED	1050	1	0
Leatherbacks	3	NED	1107	2	0
Leatherbacks	3	NED	1107	1	0
Leatherbacks	3	NED	1075	1	0
Leatherbacks	3	NED	1350	1	0
Leatherbacks	3	NED	1008	1	0
Leatherbacks	3	NED	900	1	0
Leatherbacks	3	NED	1300	1	0
Leatherbacks	3	NED	910	1	0
Leatherbacks	3	NED	1150	1	0
Leatherbacks	3	NED	900	1	0
Leatherbacks	3	NED	1269	2	0
Leatherbacks	3	NED	1325	1	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	3	NED	1170	1	0
Leatherbacks	3	NED	1375	1	0
Leatherbacks	3	NED	1080	2	0
Leatherbacks	3	GOM	768	1	0
Leatherbacks	3	NED	1120	1	0
Leatherbacks	3	NED	1200	1	0
Leatherbacks	3	NED	1080	1	0
Leatherbacks	4	NED	570	1	0
Leatherbacks	4	NED	1180	1	0
Leatherbacks	4	NED	978	1	0
Leatherbacks	4	GOM	880	2	0
Leatherbacks	4	NED	1150	1	0
Leatherbacks	4	GOM	832	1	0
Leatherbacks	4	NED	1080	3	0

Table B2 continued

Species	Quarter	Area	N		
			Hooks	Alive	Dead
Leatherbacks	4	GOM	870	1	0
Leatherbacks	4	NED	1085	1	0
Leatherbacks	4	NED	1068	1	0
Leatherbacks	4	GOM	840	1	0
Leatherbacks	4	NEC	1132	1	0
Leatherbacks	4	NEC	1172	1	0
Leatherbacks	4	NED	1200	1	0
Leatherbacks	4	NEC	1080	1	0
Leatherbacks	4	NEC	1152	1	0
Leatherbacks	4	NEC	1140	1	0
Leatherbacks	4	GOM	840	2	0
Leatherbacks	4	GOM	812	1	0
Leatherbacks	4	GOM	864	2	0
Leatherbacks	4	GOM	900	3	0
Leatherbacks	4	GOM	973	1	0
Leatherbacks	4	GOM	900	5	0
Leatherbacks	4	GOM	930	1	0
Leatherbacks	4	GOM	959	1	0
Leatherbacks	4	GOM	900	1	0
Leatherbacks	4	GOM	900	2	0
Leatherbacks	4	GOM	900	1	0
Leatherbacks	4	GOM	930	1	0
Leatherbacks	4	GOM	900	2	0
Olive Ridley	4	NED	930	1	0
Loggerhead	1	CAR	864	1	0
Loggerhead	1	SAR	820	1	0
Loggerhead	1	SAR	864	1	0
Loggerhead	1	SAR	864	1	0
Loggerhead	1	FEC	381	1	0
Loggerhead	1	SAR	1120	1	0
Loggerhead	1	SAR	960	2	0
Loggerhead	1	MAB	882	1	0
Loggerhead	1	SAR	900	4	0
Loggerhead	1	SAR	960	2	0
Loggerhead	1	SAR	975	1	0
Loggerhead	1	NCA	1071	3	0
Loggerhead	1	NCA	1024	1	0
Loggerhead	1	NCA	1042	1	0
Loggerhead	1	FEC	1175	1	0
Loggerhead	1	FEC	1230	2	0
Loggerhead	1	GOM	960	1	0
Loggerhead	1	FEC	1035	1	0
Loggerhead	1	FEC	792	1	0
Loggerhead	1	FEC	792	1	0
Loggerhead	1	FEC	335	1	0
Loggerhead	2	NCA	784	1	0

Table B2 continued

Species	Quarter	Area	N		
			Hooks	Alive	Dead
Loggerhead	2	NCA	812	1	0
Loggerhead	2	NCA	840	2	0
Loggerhead	2	NCA	864	2	0
Loggerhead	2	NEC	756	3	0
Loggerhead	2	SAB	698	1	0
Loggerhead	2	NEC	675	4	0
Loggerhead	2	GOM	576	1	0
Loggerhead	2	SAB	698	1	0
Loggerhead	2	GOM	741	1	0
Loggerhead	2	NED	1008	1	0
Loggerhead	3	NED	1355	1	0
Loggerhead	3	NED	1014	1	0
Loggerhead	3	NEC	825	1	0
Loggerhead	3	NEC	912	1	0
Loggerhead	3	GOM	815	1	0
Loggerhead	3	NEC	1120	1	0
Loggerhead	3	NED	1080	1	0
Loggerhead	3	NEC	825	1	0
Loggerhead	3	MAB	969	1	0
Loggerhead	3	NED	1230	1	0
Loggerhead	3	NED	900	1	0
Loggerhead	3	NED	1105	2	0
Loggerhead	3	NED	1080	1	0
Loggerhead	3	NED	1080	1	0
Loggerhead	3	NED	900	1	0
Loggerhead	3	NED	1075	1	0
Loggerhead	3	NED	1107	1	0
Loggerhead	3	NED	1330	2	0
Loggerhead	3	NED	1107	2	0
Loggerhead	3	NED	945	2	0
Loggerhead	3	NED	1075	1	0
Loggerhead	3	NED	585	1	0
Loggerhead	3	NED	951	2	0
Loggerhead	3	NED	1165	1	0
Loggerhead	3	NED	1080	2	0
Loggerhead	3	NED	825	1	0
Loggerhead	3	NED	1170	2	0
Loggerhead	3	GOM	812	1	0
Loggerhead	3	NED	1310	1	0
Loggerhead	3	NED	1075	1	0
Loggerhead	4	NED	1107	2	0
Loggerhead	4	NED	1170	11	0
Loggerhead	4	NED	1270	1	0
Loggerhead	4	NED	1044	2	0
Loggerhead	4	NED	1050	4	0

Table B2 continued

Species	Quarter	Area	N		
			Hooks	Alive	Dead
Loggerhead	4	NED	1240	2	0
Loggerhead	4	NED	1170	1	0
Loggerhead	4	NED	570	2	0
Loggerhead	4	NED	1270	1	0
Loggerhead	4	NED	1300	1	0
Loggerhead	4	NED	1080	1	0
Loggerhead	4	NED	1340	1	0
Loggerhead	4	NED	990	1	0
Loggerhead	4	NED	900	3	0
Loggerhead	4	NED	432	1	0
Loggerhead	4	NED	930	21	0
Loggerhead	4	NED	1195	5	0
Loggerhead	4	NEC	1132	1	0
Loggerhead	4	NEC	1172	1	0
Loggerhead	4	NED	1200	1	0
Loggerhead	4	GOM	874	1	0
Loggerhead	4	GOM	900	1	0
Loggerhead	4	FEC	324	1	0
Loggerhead	4	FEC	396	1	0
un-id	3	GOM	896	1	0
un-id	4	MAB	980	1	0

Table B3. Observer comments and serious injury codes for marine mammals. Code numbers include 7 – mouth is bound by gear , 8 – cetacean is hooked internally , 10 – line entangling the animal is likely to further entangle , and 14 – listlessness/inability to defend self.

Animal#	Species Name	Release Condition	Injury Code(s)	Observer Comments
1	Dolphin Rissos	Alive, No SI	-	entangled in mainline around torso and peduncle. 3' of mainline left on. Seemed exhausted once released. Kept breathing through hole, but didn't move away at all.
2	Dolphin Rissos	SI	8	hooked in mouth and also tangled in gangion. Removed most of gear except 1' of mono and hook. Seemed exhausted once released. Kept breathing through hole, but didn't move away at all.
3	Dolphin Common	Alive, No SI	-	hooked in skin on side. Hook removed, no gear left on animal. (CB) animal swam away strongly hour glass pattern clearly seen.
4	Dolphin Rissos	SI	10	animal was diving and surfacing freely pulled many hooks and 2 floats together on mainline released with 3-4 fm of 1.2 mm mono.
5	Beaked Whale	Alive, No SI	14	olive tan on dorsal, lighter colored ventral. Small dorsal fin-falcate. 2 pictures taken. Hooked in caudal fin, appeared dead but eventually swam away. About 2 ft of mono left. Dorsal fin aft.
6	Dolphin Atlantic Spotted	SI	8	MAD was hooked in the mouth. He swam away with 2ft of mono. Crew had an excellent chance to cut leader without a struggle initially - so no pictures. Dark colored dorsal and light ventral with spotting across entire body.
7	Whale Baleen	Alive, No SI	-	WHA was dragging the last 3 floats and beeper as we chased down the part off. He slid right off or out of gear quickly. Uncertain to whether he was hooked or tangled. He disappeared immediately. The smallish falcate dorsal back in the rear of the animal and pointed rostrum, dark colored body indicate Sei or Fin whale. Crew member reported seeing white underneath. Quick look did not allow pictures.
8	Dolphin Rissos	Alive, No SI	-	MRD hook LF flipper with J hook. Had a little scarring and some white on head, but not as much as others I have seen. All gear removed as leader was unwrapped from tail and hook removed with long pole dehooker. He swam away then dove out of sight.
9	Dolphin Rissos	Alive, No SI	-	it was entangled in main line and not hooked. All gear was removed and it quickly swam away.
10	Dolphin Rissos	Alive, No SI	-	This was a risso's dolphin with the mainline wrapped around its tail. It was not hooked. I took 2 pictures and they were able to cut away all the mainline. When the gear was removed it quickly swam away.
11	Dolphin	SI	8, 10	mouth hooked, line cut, swam away, 10 ft line est. left

Table B3 continued

Animal#	Species Name	Release Condition	Injury Code(s)	Observer Comments
12	Dolphin Rissos	Alive, No SI	-	Animal was foul hooked in the tail with 16/0 circle hook 10degree offset. Live was cut leaving hook and 6" of gangion on animal. On release animal swam away strong.
13	Dolphin Bottlenose	Alive, No SI	-	Dolphin had drop line wrapped around tail and not hooked. It was brought on board and measured. All line was removed. I think it was female. Swam away very fast.
14	Dolphin Rissos	Alive, No SI	-	Did not appear to be entangled. The gangion broke. Animal very lively and strong, swam away alive, I saw no others in the area.
15	Dolphin Striped	Alive, No SI	-	Entangled in mainline, all line removed. MSD swam away quickly along surface. Mainline wrapped around beak many times.
16	Dolphin Rissos	Dead	-	Not entangled. Came up dead. Probably due to swallowed hook, not drowning
17	Dolphin Rissos	Alive, No SI	-	Not hooked. Mainline looped around tail. All gear removed. Entangled next to float.
18	Dolphin Rissos	Alive, No SI	-	MRD entangled in mainline. Main line around tail and mouth. All line removed. Dove quickly
19	Dolphin Rissos	Alive, No SI	-	entangled in mainline around tail. Very active. All line removed. Swam away quickly along surface.
20	Dolphin Rissos	Alive, No SI	-	mainline around tail and fins. All line removed. Swam away quickly at 45 degree angle.
21	Dolphin Common	Alive, No SI	-	The dolphin was lightly wrapped in mainline was released and swam away strong and fast. Not hooked. 2 wraps around body line forward of pectoral fins and once behind pretty tight. Took 45 min to cut line, all line was removed. Unable to verify species from photo but features described by observer does indicate common dolphin sp. tricolor pattern.
22	Beaked Whale	SI	7, 10	brown color-small dorsal about 2/3 way to tail. Beaked. Relatively slim body. Mainline wrapped around tail and through mouth. Boat cut mono on one side of whale hoping it would unwrap. Then tried to pull from other side for 55 minutes to get whale close enough to cut mono with pole cutter. Mono finally broke with aprpx 75' going with whale.

Table B3 continued

Animal#	Species Name	Release Condition	Injury Code(s)	Observer Comments
23	Whale Minke	Alive, No SI	-	Juvenile Minke whale. Dark in color, head almost flat and V-shaped. Wrapped tail in mainline. Broke mainline and slipped off tail. Capt. Saw white tipped pectoral fin and light colored belly. (Debrief-CB) No gear remained on animal. Appeard to be swimming strong before line broke, animal disappeared after line broke.
24	Dolphin Rissos	SI	10	Dove before photos could be taken, tail hooked. Large dorsal fin mid-body and scarring on top of head. Approx 50' mono left on animal. Sawm off immediately.
25	Pilot Whale	SI	10	next float final beeper. Tail wrapped, 4 feet line left on animal. (Debrief CB) ID from photo, dorsal location forward on body and blunt head shape per debrief with observer.
26	Pilot Whale	Alive, No SI	-	unknown if tangled or hooked. Involved with mainline and leader, came loose before observer could get a good look.
27	Pilot Whale	SI	10	main line tangled around the whale's body. Line cut, about 6' of line remaining, loose believe it will fall off. No hooks or buoys attached.
28	Pilot Whale	Alive, No SI	-	surface hook. Animal hooked in right pectoral flipper. Animal popped off hook, no gear remaining. Hung out at surface for 2-3 minutes before swimming away.
24	Dolphin Rissos	SI	10	Dove before photos could be taken, tail hooked. Large dorsal fin mid-body and scarring on top of head. Approx 50' mono left on animal. Sawm off immediately.

Table B4. Observer comments for marine turtles. Species codes are; TLB – Leatherback, TTL – Loggerhead, and TOR – Olive Ridley.

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
1	TLB	GOM	C02016	10	74.8	alive, injured	front flipper/shoulder/arpit	na	no	no	8.00	5.00		
1	TTL	NCA	T01065	3	70.6	alive, injured	beak/mouth/tongue/glottis	upper	yes	no	0.00	2.80		
1	TTL	NCA	T01065	3	69.9	alive, injured	swallowed	na	no	no	0.50	2.50		
1	TTL	NCA	T01065	3	70.1	alive, injured	beak/mouth/tongue/glottis	lower	yes	no	0.00	3.00		
1	TTL	NCA	T01065	5	69.5	alive, injured	beak/mouth/tongue/glottis	lower	yes	no	0.00		60	
1	TTL	NCA	T01065	11	69.5	alive, injured	beak/mouth/tongue/glottis	upper	yes	no	0.00		62.5	
1	TLB	FEC	A02005	2	69.9	alive, injured	front flipper/shoulder/arpit	na	no	no	5.00	5.00		
1	TLB	FEC	A02005	3	73.2	alive, injured	unknown external	na/unk	yes	no	0.00	4.50		
1	TTL	FEC	A02005	10	76.4	alive, injured	swallowed	na	no	no	0.60		77.2	
1	TTL	FEC	A02005	13	77.4	alive, injured	swallowed	na	no	no	0.60		70.1	
1	TTL	GOM	P01087	4	72.9	alive, injured	beak(external)/head/neck	na/unk	yes	no	0.00	2.00		
1	TTL	FEC	A02005	14	75.3	alive, injured	swallowed	na	no	no	0.60		70	
1	TLB	MAB	C02014	2	76.4	alive, injured	mouth	side	no	yes	3.00	4.00		
1	TTL	FEC	J02019	4	76.1	alive, injured	swallowed	na	no	no	0.30		69	
1	TLB	FEC	J02019	5	76.2	alive, injured	front flipper/shoulder/arpit	na	no	no	3.00	4.00		
1	TLB	FEC	J02019	5	75.4	alive, injured	carapace	na	no	no	3.00	4.00		
1	TTL	FEC	J02019	5	78.1	alive, injured	beak/mouth/tongue/glottis	u	yes	no	0.00		65	
1	TTL	FEC	S01047	5	78	alive, injured	swallowed	na	no	no	0.50	3.00		
1	TLB	GOM	Q02030	7		alive, injured	unknown external	na/unk	no	no	30.00	4.00		
1	TLB	GOM	Q02030	8		alive, uninjured	not hooked	na	na	yes	0.00	4.00		
1	TLB	GOM	Q02030	9		alive, injured	unknown external	na/unk	no	no	10.00	3.00		
1	TLB	GOM	P01087	4	73.4	alive, injured	front flipper/shoulder/arpit	na	no	no	1.00	3.00		
1	TTL	FEC	A02005	13	77.6	alive, injured	swallowed	na	no	no	0.60		72.3	
1	TLB	GOM	P01085	4	72	alive, injured	front flipper/shoulder/arpit	na	no	no	2.00	4.00		
1	TTL	SAR	W01032	5	74.3	alive, injured	beak/mouth/tongue/glottis	lower	yes	no	0.00		71	

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
1	TTL	SAR	W01032	5	75.3	alive, injured	swallowed	na	no	no	0.20		67	
1	TTL	SAR	W01032	6	76	alive, injured	swallowed	na	no	no	0.20		63	
1	TTL	SAR	W01032	6	76.4	alive, injured	swallowed	na	no	no	0.20		71	
1	TTL	SAR	W01032	6	76.4	alive, injured	beak/mouth/ tongue/glottis	lower	yes	no	0.00		66	
1	TTL	SAR	W01032	6	78	alive, injured	swallowed	na	no	no	0.20		62	
1	TTL	SAR	W01032	7	75.8	alive, injured	swallowed	na	no	no	0.20		70	
1	TTL	SAR	W01032	7	77.1	alive, injured	swallowed	na	no	no	0.20		65	
1	TTL	SAR	W01032	8	74.6	alive, injured	beak/mouth/ tongue/glottis	lower	yes	no	0.00		78	
1	TTL	SAR	W01032	2	75.6	alive, injured	swallowed	na	no	no	0.00		67	
1	TLB	SAB	A02004	3	77.8	alive, injured	front flipper/ shoulder/armpit	na	no	no	9.00	4.00		
1	TTL	SAB	C02014	2	76	alive, injured	mouth	side	no	no	2.00	1.50		
1	TLB	GOM	P01085	6	72.2	alive, injured	beak (external)/ head/neck	side	no	no	1.00	4.00		
1	TLB	GOM	P01085	6	72	alive, injured	carapace/plastron	na	no	no	2.00	4.00		
1	TLB	GOM	S01046	9		alive, injured	unknown external	na/unk	no	no	3.00	5.00		
1	TLB	GOM	S01046	11		alive, injured	unknown external	na/unk	no	no	2.00	6.00		
1	TTL	CAR	J02018	1	81.1	alive, injured	mouth	lower	yes	no	0.00		70.4	
1	TTL	SAR	J02018	4	76.1	alive, injured	swallowed	na	no	no	0.50		63.4	
1	TTL	SAR	J02018	6	74.4	alive, injured	swallowed	na	no	no	0.50		67.5	
1	TTL	SAR	J02018	7	74.5	alive, injured	swallowed	na	no	no	0.50		70.5	
1	TTL	FEC	T02005	2	76	alive, injured	beak/mouth/ tongue/glottis	unk	no	no	0.50	2.00		
1	TLB	GOM	N03002	2	77.8	alive, uninjured	not hooked	na	na	yes	6.00	4.00		
1	TLB	SAB	A02004	2	77.7	alive, injured	front flipper/ shoulder/armpit	na	no	no	8.00	5.50		
1	TLB	SAB	A02004	2	77.5	alive, injured	front flipper/ shoulder/armpit	na	no	no	6.50	4.60		
2	TTL	NCA	T02006	5	71.2	alive, injured	swallowed	na	no	no	0.00		69	64.4
2	TLB	CAR	CABUM1	8	85.9	alive, injured	shoulder		yes	no	0.00	5.00		
2	TTL	GOM	Q02033	5	80.8	alive, injured	swallowed	na	no	no	0.50	2.50		
2	TLB	GOM	Q02031	4	75.6	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
2	TLB	GOM	Q02031	1	75.3	fresh dead	not known if hooked	na/unk	unk	yes	2.00	5.00		

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
2	TTL	NEC	W01033	13	74	alive, injured	swallowed	na	no	no	0.00		63.2	57.6
2	TTL	NCA	T02006	17	69.4	alive, injured	swallowed	na	no	no	0.30		66.2	60.5
2	TTL	GOM	J02020	3	82.7	alive, injured	mouth	lower	no	no	2.00	2.00		
2	TLB	CAR	CABUM1	7	85.8	alive, injured	armpit	na	no	no	0.00	4.00		
2	TTL	NCA	T02006	8	70.6	alive, injured	swallowed	na	no	no	0.10		61	55.8
2	TLB	GOM	S01048	3		alive, injured	unknown location	na/unk	no	no	6.00	5.00		
2	TLB	GOM	P01088	5	76.4	alive, injured	carapace	na	no	yes	0.00	4.00		
2	TLB	GOM	C02017	4	82.6	alive, uninjured	not hooked	na	na	yes	6.00	4.50		
2	TLB	GOM	P01089	3	81.4	alive, injured	front flipper	na	no	no	1.00	4.00		
2	TTL	NEC	W01033	13	74.4	alive, injured	mouth	lower	yes	no	0.00		77	71.3
2	TTL	NEC	W01033	15	72.8	alive, injured	swallowed	na	no	no	0.00		57.2	53
2	TTL	NEC	W01033	15	72.6	alive, injured	swallowed	na	no	no	0.20		60.6	56.4
2	TTL	NEC	W01033	15	72.5	alive, injured	swallowed	na	no	no	0.10		57	52.8
2	TTL	NEC	W01033	15	71.9	alive, injured	tongue	lower	yes	no	0.00		58.8	55
2	TLB	NEC	W01033	16	74.9	alive, injured	carapace	na	yes	no	0.00	4.90		
2	TLB	NCA	T02006	14	69.9	alive, injured	front flipper/ shoulder/armpit	na	no	no	1.50	5.00		
2	TTL	FEC	N03006	1	77.8	alive, injured	beak/mouth/ tongue/glottis	lower	no	no	0.50	2.60		
2	TTL	NCA	T02006	17	69.4	alive, injured	swallowed	na	no	no	0.10		57.4	52.6
2	TTL	NEC	W01033	13	71	alive, injured	swallowed	na	no	no	0.20		67.2	60.2
2	TTL	SAB	N03005	2	80	alive, injured	mouth	lower	no	no	0.50	3.00		
2	TLB	MAB	I02013	3	65.2	alive, injured	front flipper	na	no	no	5.00	5.20		
2	TLB	MAB	I02013	2	74.2	alive, injured	armpit	na	no	no	66.00	5.00		
2	TLB	MAB	I02013	2	74.4	alive, injured	shoulder	na	no	no	3.00	5.00		
2	TLB	GOM	T02007	1	84.5	alive, injured	front flipper	na	no	no	0.50	4.00		
2	TTL	NCA	W01033	4	71.2	alive, injured	swallowed	na	no	no	0.00		53	48.6
2	TTL	NCA	W01033	4	70.6	alive, injured	swallowed	na	no	no	0.10		56	52.2
3	TLB	NED	T02009	12	64.2	alive, injured	shoulder	na	yes	no	0.00	5.00		
3	TTL	NED	A02008	5	67.7	alive, injured	swallowed	na	no	no	0.00		55	51.5
3	TLB	NED	J02023	9	60.6	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	A02008	7	64.2	alive, injured	armpit	na	yes	no	0.00	4.00		
3	TLB	NED	A02008	5	67.8	alive, injured	armpit	na	yes	no	0.00	5.00		
3	TLB	NED	R03001	1	67.8	alive, injured	front flipper	na	yes	no	0.00	3.50		
3	TTL	NED	A02008	5	68	alive, injured	mouth	u	yes	no	0.00		51.9	46.7
3	TLB	NED	A02008	3	64.3	alive, injured	armpit	na	yes	no	0.00	5.00		
3	TTL	NED	A02008	2	69.3	alive, uninjured	not hooked	na	na	yes	0.00		64	60.4
3	TLB	NED	T02009	14	62.6	alive, injured	shoulder	na	yes	yes	0.00	5.00		
3	TLB	NED	D04002	6	65.1	alive, injured	shoulder	na	yes	no	0.00	5.00		

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
3	TTL	NED	R03001	1	67.8	alive, injured	tongue	lower	yes	no	0.00		63.6	58.2
3	TLB	NED	J02022	12	64	alive, injured	shoulder	na	no	yes	0.00	5.00		
3	TTL	NED	T02009	15	61.8	alive, injured	swallowed	na	no	no	0.10		59	57
3	TTL	NED	U03001	2	63.5	alive, injured	tongue	na	yes	no	0.00		67.2	60.7
3	TLB	NED	C02019	17	62	alive, injured	shoulder	na	yes	no	0.00	4.50		
3	TTL	NED	C02019	16	62.7	alive, injured	beak internal	lower	yes	no	0.00		63.5	58.5
3	TTL	NED	C02019	16	63.7	alive, injured	mouth	lower	yes	no	0.00		57	53.5
3	TTL	NED	C02019	13	66.3	alive, injured	unknown internal	unk	no	no	8.00	1.50		
3	TTL	NED	C02019	13	65.7	alive, injured	tongue	na	yes	no	0.00		76	72
3	TLB	NED	S01051	8	64.1	alive, injured	mouth	lower	yes	yes	0.00		145	
3	TLB	NED	U03001	4	58.2	alive, injured	not hooked	na	na	yes	0.00	6.00		
3	TLB	NED	U03001	4	58.5	alive, injured	groin	na	yes	no	0.00	6.00		
3	TLB	NED	U03001	4	58.9	alive, injured	armpit	na	yes	yes	0.00	6.00		
3	TLB	NED	R03001	9	62.5	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	U03001	4	57.8	alive, injured	armpit	na	yes	no	0.00	7.00		
3	TTL	NED	D04002	6	64.7	alive, injured	mouth	lower	yes	no	0.00		63	57.5
3	TLB	NED	U03001	2	61.8	alive, injured	armpit	na	yes	no	0.00	6.50		
3	TLB	NED	U03001	1	66.4	alive, injured	armpit	na	yes	no	0.00	6.00		
3	TTL	NED	C02019	7	63.2	alive, injured	swallowed	na	no	no	1.00		68	63
3	TLB	NED	C02019	5	66	alive, injured	shoulder	na	yes	yes	0.00	4.50		
3	TTL	NED	C02019	5	65.4	alive, injured	swallowed	na	no	no	0.00		75	68
3	TLB	NED	C02019	2	63	alive, injured	unknown external	na	no	no	1.00	5.50		
3	TTL	NED	S01051	10	62.8	alive, injured	swallowed	na	no	no	0.00		65	56.1
3	TTL	NED	S01051	10	62.3	alive, injured	swallowed	na	no	no	0.00		56	52.3
3	TLB	NED	C02019	18	64.2	alive, injured	armpit	na	yes	no	0.00	5.00		
3	TLB	NED	U03001	4	60.5	alive, injured	armpit	na	yes	no	0.00	6.00		
3	TLB	NED	S01051	8	64	alive, injured	armpit	na	yes	no	0.00		140	
3	TLB	NED	J02022	7	63.9	alive, injured	unknown external		no	no	12.00	7.00		
3	TTL	NED	T02008	1	60.1	alive, injured	mouth	lower	yes	no	0.00		55.4	52.1
3	TLB	NED	A02007	15	66.6	alive, injured	armpit	na	yes	no	0.00	5.00		
3	TTL	NED	D04003	10	61.5	alive, injured	swallowed	na	no	no	0.00		69.2	63.7
3	TTL	NED	D04003	9	57.9	alive, injured	beak/mouth/ tongue/glottis	unk	yes	no	0.00	2.00		
3	TTL	NED	D04003	5	64.8	alive, injured	mouth	lower	yes	no	0.00		55.3	51.7
3	TTL	NED	D04003	5	58.9	alive, injured	swallowed	na	no	no	0.10		63.2	58.3
3	TTL	NED	D04003	4	65.3	alive, injured	swallowed	na	no	no	0.10		66	61.4
3	TTL	NED	C02020	15	62.8	alive, injured	mouth	lower	yes	no	0.00		63	57
3	TLB	NED	C02020	7	59.6	alive, injured	front flipper	na	no	yes	0.20	5.00		
3	TLB	NED	T02008	22	63.5	alive, injured	not hooked	na	na	yes	0.00	4.50		
3	TTL	NED	S01051	8	64.1	alive, injured	mouth	lower	yes	no	0.00		65	59.2
3	TLB	NED	T02008	24	65.8	alive, injured	armpit	na	yes	no	0.00	4.00		
3	TLB	NED	S01051	7	61.3	alive, injured	shoulder	na	yes	no	0.00		137.1	
3	TTL	NED	U03002	16	63.2	alive, injured	swallowed	na	yes	no	0.00		69.8	61.3

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
3	TTL	NED	U03002	16	63.8	alive, injured	beak internal	lower	yes	no	0.00		48.8	44.7
3	TTL	NED	U03002	10	64.2	alive, injured	swallowed	na	no	no	0.00		64.8	58.3
3	TTL	NED	U03002	3	60.8	alive, injured	beak internal	lower	yes	no	0.00		66.5	61.5
3	TTL	NED	U03002	2	60.5	alive, injured	beak internal	lower	yes	no	0.00		62.3	57.7
3	TLB	NED	U03002	2	61.4	alive, injured	front flipper	na	yes	no	0.00	6.00		
3	TLB	NED	A02007	14	67	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
3	TLB	NED	A02007	9	62.5	alive, injured	mouth	upper	yes	no	0.00	5.00		
3	TLB	NED	A02007	4	64.8	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	U03001	4	62.8	alive, injured	not known if hooked	unk	yes	yes	0.00	6.00		
3	TTL	NED	C02020	5	62.2	alive, injured	mouth	side	yes	no	0.00		47	43.5
3	TTL	NED	X02002	7	69.7	alive, injured	swallowed	na	no	no	0.00		57.7	53.4
3	TLB	NED	J02022	5	65.2	alive, injured	shoulder	na	no	no	0.00	6.00		
3	TLB	NED	J02022	5	64.7	alive, injured	shoulder	na	yes	no	0.00	6.00		
3	TLB	NED	J02022	5	64.7	alive, injured	shoulder	na	no	no	1.00	6.00		
3	TLB	NED	T02009	12	63.7	alive, uninjured	not hooked	na	3	yes	0.00	5.00		
3	TLB	NED	T02009	11	63.8	alive, injured	shoulder	na	yes	no	0.00	5.00		
3	TLB	NED	T02009	6	63.3	alive, injured	armpit	na	no	yes	0.10	4.00		
3	TTL	NED	T02009	3	64.1	alive, injured	swallowed	na	no	no	0.10		66.5	61
3	TTL	NED	T02009	3	65.6	alive, injured	swallowed	na	no	no	0.10		63.3	60.8
3	TLB	NED	R03002	2	64.2	alive, unknown	not known if hooked	unk	yes	unk	0.00	6.00		
3	TLB	NED	R03002	2	63.4	alive, injured	front flipper	na	yes	no	0.00	5.00		
3	TLB	NED	T02008	19	68.8	alive, injured	armpit	na	no	no	2.00	4.50		
3	TLB	NED	X02002	9	65.4	alive, injured	beak internal	side	yes	yes	0.00	4.00		
3	TLB	NED	S01051	10	62.5	alive, injured	shoulder	na	yes	no	0.00		137	
3	TLB	NED	M01025	13	61.3	alive, injured	armpit	na	yes	no	0.00	4.60		
3	TLB	NED	M01025	9	66	alive, injured	armpit	na	no	no	0.00	4.90		
3	TLB	NED	M01025	6	67.9	alive, uninjured	not hooked	na	na	yes	0.00	4.60		
3	TLB	NED	M01025	6	68.4	alive, injured	plastron	na	yes	no	0.00	4.40		
3	TLB	NED	M01025	5	67.5	alive, injured	shoulder	na	yes	yes	0.00	4.40		
3	TLB	NED	M01025	5	68.7	alive, injured	not hooked	na	na	yes	0.00	4.30		
3	TLB	NED	M01025	5	66.7	alive, uninjured	not hooked	na	na	yes	0.00	4.10		
3	TLB	NED	M01025	5	66.3	alive, injured	armpit	na	no	yes	0.00	4.30		
3	TLB	NED	M01025	5	68	alive, injured	flipper (front or back)	na	yes	no	0.00	4.40		
3	TLB	NED	M01025	5	66.6	alive, injured	unknown location	unk	no	no	0.00	4.30		
3	TLB	NED	T02008	25	61.3	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	R03002	1	63.2	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
3	TLB	NED	I02016	12	65	alive, injured	armpit	na	no	no	2.00	5.60		
3	TTL	NED	I02016	4	65.4	alive, injured	mouth	lower	yes	no	0.00		64.2	57.6

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
3	TTL	NED	R03003	10	66	alive, injured	front flipper	na	yes	no	0.00		54.3	50
3	TTL	NED	R03003	10	67.9	alive, injured	beak internal	lower	yes	no	0.00		63.8	59.3
3	TTL	NED	R03003	9	64.3	alive, injured	mouth	side	yes	no	0.00		63.5	59.4
3	TLB	NED	R03003	8	61.3	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	R03003	8	60.8	alive, injured	armpit	na	no	no	0.00	5.00		
3	TLB	NED	R03003	8	66.1	alive, injured	armpit	na	no	yes	0.30	6.00		
3	TTL	NED	R03003	7	66.7	alive, injured	front flipper	na	yes	no	0.00		52.3	47.4
3	TTL	NED	R03003	4	67.8	alive, injured	mouth	lower	yes	no	0.00		61.3	56.5
3	TTL	NED	R03003	15	69.5	alive, injured	swallowed	na	no	no	0.10		66.4	61.2
3	TTL	NED	C02020	5	62.1	alive, injured	swallowed	na	no	no	0.00		50	47
3	TTL	NED	R03003	15	69.9	alive, injured	beak internal	side	yes	no	0.00	2.00		
3	TLB	NED	I02016	11	65	alive, uninjured	not hooked	na	na	yes	0.00	5.30		
3	TLB	NED	I02016	8	56.8	alive, injured	unknown location	na/unk	yes	unk	0.00	5.60		
3	TTL	NED	I02016	6	62.9	alive, injured	tongue	na	yes	no	0.00		60	55.5
3	TTL	NED	I02016	4	64.4	alive, injured	swallowed	na	yes	no	0.00		56	51.9
3	TTL	NED	I02016	4	64.3	alive, injured	front flipper	na	yes	no	0.00		54.6	50
3	TTL	NED	I02016	4	65.6	alive, injured	swallowed	na	no	no	0.10		70	65.1
3	TTL	NED	I02016	4	65.4	alive, injured	mouth	side	yes	no	0.00		70.8	65.3
3	TTL	NED	I02016	4	65.3	alive, injured	swallowed	na	no	no	0.10		68.2	64.2
3	TLB	NED	W01034	7	60.6	alive, uninjured	not hooked	na	na	yes	0.00	5.60		
3	TLB	NED	R03003	4	67.8	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
3	TTL	NED	R03003	15	69.5	alive, injured	swallowed	na	no	no	0.00		62.6	59.3
3	TTL	NED	W01036	8	64.6	alive, injured	mouth	upper	yes	no	0.00		57	52.6
3	TTL	NED	R03003	15	67.3	alive, injured	glottis	lower	yes	no	0.00		61.1	57.3
3	TTL	NED	R03003	15	67.5	alive, injured	swallowed	na	no	no	0.00		66.3	61
3	TOR	NED	R03003	15	69.9	alive, injured	tongue	lower	yes	no	0.00		57.9	53.3
3	TTL	NED	R03003	15	69.9	alive, injured	swallowed	na	no	no	0.00		54	50.4
3	TTL	NED	R03003	15	69.9	alive, injured	swallowed	na	no	no	0.10		60.9	56.7
3	TTL	NED	R03003	15	69.9	alive, injured	mouth	side	yes	no	0.00		72	67.4
3	TTL	NED	R03003	15	69.4	alive, injured	swallowed	na	no	no	0.00		64	59.4
3	TTL	NED	R03003	15	69.6	alive, injured	beak internal	lower	yes	no	0.00		58.6	53.2
3	TTL	NED	R03003	10	65.8	alive, injured	beak internal	lower	yes	no	0.00		69.1	63.5
3	TTL	NED	R03003	15	68.5	alive, injured	beak internal	upper	yes	no	0.00		71.8	65.7
3	TTL	NED	I02016	4	65	alive, injured	beak internal	unk	yes	no	0.00		66.2	62.4
3	TTL	NED	R03003	15	67.7	alive, injured	mouth	lower	yes	no	0.00		57.5	52.5
3	TTL	NED	R03003	15		alive, injured	swallowed	na	no	no	0.00		55.2	51.6
3	TTL	NED	R03003	15	69.8	alive, injured	swallowed	na	no	no	0.10		64.9	59.4
3	TTL	NED	R03003	15	69.8	alive, injured	beak internal	upper	yes	no	0.00		54.2	49.6
3	TTL	NED	R03003	15	69.8	alive, injured	swallowed	na	no	no	0.00		64.2	57.3
3	TTL	NED	R03003	15	69.9	alive, injured	swallowed	na	no	no	0.10		64	59.1
3	TTL	NED	R03003	15	69.9	alive, injured	beak internal	lower	yes	no	0.00		57.8	52.9
3	TTL	NED	R03003	15	69.9	alive, injured	mouth	side	yes	no	0.00		58.3	55.6

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
3	TTL	NED	R03003	15	69.9	alive, injured	swallowed	na	no	no	0.10		60.2	55.7
3	TTL	NED	R03003	15	68.5	alive, injured	swallowed	na	no	no	0.00		57.9	52
3	TLB	NED	W01035	8	63.1	alive, injured	mouth	lower	no	no	0.00	5.20		
3	TTL	NED	I02016	4	65	alive, injured	swallowed	na	no	no	0.10		56.3	51.2
3	TLB	GOM	Q02034	4	85.5	alive, injured	beak external	unk	no	no	3.00	3.00		
3	TLB	NED	B02005	8	61.6	alive, injured	unknown location	na/unk	yes	no	0.00			
3	TLB	NED	I02014	4	62.3	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
3	TLB	NED	W01034	1	61.7	alive, injured	armpit	na	no	no	0.20	5.00		
3	TLB	NED	W01034	3	59.3	alive, injured	armpit	na	yes	no	0.00	5.00		
3	TLB	NED	U03001	4	62	alive, injured	armpit	na	yes	yes	0.00	6.00		
3	TTL	NED	X02002	1	71.1	alive, injured	tongue	na	yes	no	0.00		61	57.8
3	TLB	GOM	Q02034	3	85	alive, injured	unknown external	na/unk	no	no	1.00	4.00		
3	TTL	NED	W01035	9	63.2	alive, injured	beak internal	upper	yes	no	0.00		64.4	59.3
3	TLB	GOM	P01091	3	86	alive, injured	carapace	na	no	no	0.00	4.00		
3	TLB	NED	I02015	14	63.6	alive, injured	armpit	na	yes	no	0.00	4.50		
3	TTL	NED	S01050	9	62.2	alive, injured	mouth	upper	yes	no	0.00		58	53.5
3	TLB	NED	S01050	21	63.6	alive, uninjured	not hooked	na	na	yes	0.00	6.00		
3	TLB	NED	S01052	17	57.1	alive, unknown	not known if hooked	na/unk	yes	unk	0.00	5.50		
3	TTL	NED	S01052	5	62.7	alive, injured	mouth	upper	yes	no	0.00		60	55
3	TTL	NED	S01052	5	63.5	alive, injured	swallowed	na	no	no	0.20		60	55.4
3	TLB	NED	I02015	13	59.2	alive, injured	shoulder	na	yes	yes	0.00		151.2	
3	TLB	NED	I02015	4	63.5	alive, injured	shoulder	na	no	yes	0.00	5.00		
3	TTL	NED	I02015	1	64.1	alive, injured	swallowed	na	no	no	0.00		61.3	55.3
3	TLB	NED	W01035	13	62.8	alive, uninjured	not hooked	na	na	yes	0.00	5.20		
3	TTL	GOM	Q02035	1	85.5	alive, injured	tongue	na	no	no	2.00	3.10		
3	TTL	NED	I02016	4	64.2	alive, injured	swallowed	na	no	no	0.20		57.8	51.7
3	TTL	NED	I02016	4	64.9	alive, injured	tongue	na	yes	no	0.00		66.2	60.2
3	TTL	NED	I02016	4	64.7	alive, injured	swallowed	na	no	no	0.10		60	53.9
3	TLB	NED	U03003	2	62.4	alive, injured	front flipper/ shoulder/armpit	na	yes	no	0.00	6.00		
3	TTL	NED	G03004	8	70	alive, injured	mouth	side	yes	no	0.00		57	53.3
3	TTL	GOM	Q02036	11	86	alive, injured	unknown internal	na/unk	no	no	0.10	3.00		
3	TLB	GOM	F03002	2	84.9	alive, unknown	not known if hooked	na/unk	no	unk	3.00	5.00		
3	TTL	NEC	F03001	3	74.4	alive, injured	tongue	na	no	no	0.30	4.00		
3	TTL	NEC	F03001	1	77	alive, injured	beak internal	lower	no	no	6.00	2.50		
3	TLB	GOM	Q02034	4	85.5	alive, injured	shoulder	na	no	no	2.00	3.50		
3	TTL	NEC	R02010	1	80	alive, injured	swallowed	na	no	no	0.00		66	
3	TTL	NED	I02015	1	63.8	alive, injured	tongue	side	yes	no	0.00		59.2	53.7
3	TTL	NEC	X02001	10	76.5	alive, injured	groin	na	yes	no	0.00		74.5	

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
3	TLB	NEC	X02001	12	75.5	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
3	un-id	GOM	G03001	3	81.1	alive, unknown	not known if hooked	na/unk	na	unk	0.00	4.00		
3	TLB	SAB	Y03002	4	84.6	alive, injured	unknown external	na/unk	no	no	6.00	5.00		
3	TTL	NED	R03003	4	67.8	alive, injured	beak internal	side	yes	no	0.00		65.3	61.4
3	TTL	NED	R03003	1	69.8	alive, injured	front flipper	na	yes	no	0.00		65.4	62.3
3	TTL	NED	R03003	1	68.9	alive, injured	mouth	upper	yes	no	0.00		54.5	51
3	TTL	NED	R03003	1	70	alive, injured	mouth	lower	yes	no	0.00		64	58.2
3	TTL	NED	R03003	1	70.5	alive, injured	front flipper	na	yes	no	0.00		57	50.6
3	TTL	MAB	F03001	11	81	alive, injured	swallowed	na	no	no	2.00	3.00		
4	TTL	GOM	J02025	9	74.4	alive, injured	swallowed	na	no	no	0.50	3.00		
4	TLB	GOM	P01095	6	82.5	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
4	TLB	GOM	J02025	10	75	alive, injured	beak/mouth/ tongue/glottis	lower	no	no	3.00	5.00		
4	TLB	NEC	T02010	15	63	alive, injured	shoulder	na	yes	no	0.00	5.00		
4	TLB	NEC	T02010	17	62.4	alive, injured	shoulder	na	yes	no	0.00	5.00		
4	TLB	GOM	F03003	4	79	alive, unknown	not known if hooked	na/unk	no	yes	18.00	6.00		
4	TLB	GOM	F03004	2	79.7	alive, injured	armpit	na	no	no	4.00	5.00		
4	TLB	GOM	P01094	8	85	alive, injured	carapace/plastron	na	no	no	0.00	4.00		
4	TLB	GOM	P01094	5	83.6	alive, injured	front flipper	na	no	no	2.00	4.00		
4	TLB	GOM	P01094	5	82.5	alive, injured	armpit	na	no	no	0.00			
4	TLB	MAB	J02024	5	63.3	alive, injured	shoulder	na	no	no	0.00	5.00		
4	TLB	GOM	Q02038	4	73	alive, injured	front flipper	na	no	no	0.50	6.00		
4	un-id	MAB	B02006	9	61	alive, injured	unknown location	na/unk	no	no	60.00	2.50		
4	TLB	GOM	Q02038	5	75.8	alive, injured	armpit	na	yes	no	2.00	5.00		
4	TTL	NED	A02009	6	64	alive, injured	mouth	side	yes	no	0.00		55.6	50.7
4	TTL	NED	A02009	6	62	alive, injured	mouth	lower	yes	no	0.00		61	56.5
4	TTL	NED	A02009	6	64.8	alive, injured	front flipper	na	yes	no	0.00		69.5	62.8
4	TTL	NED	A02009	6	64.8	alive, injured	swallowed	na	no	no	0.10		60	55.6
4	TTL	NED	A02009	6	64.8	alive, injured	front flipper	na	yes	no	0.00		61.2	57.4
4	TTL	NED	A02009	17	61.7	alive, injured	unknown location	unk	no	no	10.00	2.00		
4	TLB	NED	A02009	14	59	alive, injured	armpit	na	no	no	30.00	4.00		
4	TTL	GOM	Q02037	5	78	alive, unknown	not known if hooked	na/unk	na	unk	0.00	4.00		
4	TLB	GOM	P01095	5	82.5	alive, injured	carapace	na	no	no	2.00	4.00		
4	TLB	MAB	J02024	3	63.4	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
4	TLB	GOM	J02025	6	75.2	alive, uninjured	not hooked	na	na	yes	0.00	5.00		

Table B4 continued

Qtr.	Spp.	Area	Trip	Haul	Temp C	Condition	Hook location	Jaw location	hook removed	Entangled capture	Line left (ft)	CL est (ft)	CCL (cm)	SCL (cm) N-T
4	TLB	GOM	P01096	9	74.2	alive, injured	carapace	na	no	no	1.00	4.00		
4	TLB	GOM	P01096	6	75	alive, injured	carapace	na	no	no	3.00	4.00		
4	TLB	GOM	J02025	10	75.7	alive, injured	shoulder	na	no	no	3.00	4.00		
4	TLB	GOM	P01095	5	82	alive, injured	armpit	na	no	no	0.00	4.00		
4	TLB	GOM	J02025	9	74.7	alive, injured	shoulder	na	no	no	4.00	4.00		
4	TLB	GOM	J02025	8	75	alive, uninjured	not hooked	na	na	yes	0.00	5.00		
4	TLB	GOM	J02025	8	74.9	alive, injured	shoulder	na	no	no	4.00	5.00		
4	TTL	MAB	T02010	14	62.2	alive, injured	swallowed	na	no	no	0.10		74	63
4	TTL	NEC	T02010	15	63.1	alive, injured	mouth	side	yes	no	0.00		74	66.8
4	TLB	MAB	T02010	14	61.6	alive, injured	front flipper	na	yes	no	0.00	5.00		
4	TTL	FEC	S01053	2	75.1	alive, injured	swallowed	na	no	no	2.00	2.00		
4	TTL	FEC	S01053	1	75.2	alive, injured	swallowed	na	no	no	1.50	3.00		
4	TLB	GOM	J02025	6	75.2	alive, injured	shoulder	na	no	no	2.00	5.00		
4	TLB	GOM	J02025	6	75.3	alive, injured	shoulder	na	no	no	1.00	5.00		
4	TLB	GOM	J02025	6	75	alive, injured	shoulder	na	no	no	2.00	5.00		
4	TLB	GOM	J02025	6	75	alive, injured	shoulder	na	no	no	2.00	5.00		
4	TLB	GOM	J02025	5	76	alive, injured	shoulder	na	no	no	2.00	5.00		
4	TLB	GOM	J02025	5	76	alive, injured	shoulder	na	no	no	3.00	4.00		
4	TLB	GOM	J02025	5	75.9	alive, injured	shoulder	na	no	no	15.00	6.00		
4	TLB	GOM	J02025	2	77	alive, uninjured	not hooked	na	na	yes	0.00	4.00		
4	TLB	GOM	J02025	2	77	alive, injured	shoulder	na	no	no	3.00	4.00		
4	TLB	GOM	J02025	7	75	alive, injured	shoulder	na	no	no	3.00	5.00		